

POPULAR Computing WEEKLY

Forward with the Spectrum Plus 3?

see page 16

NEWS DESK

Games consoles: a
case of hit and miss

CP/M signed up for
Spectrum Plus 3

Compunet launches
new multi-user game

The Pawn spawns
Guild of Thieves

Commodore 64
utilities

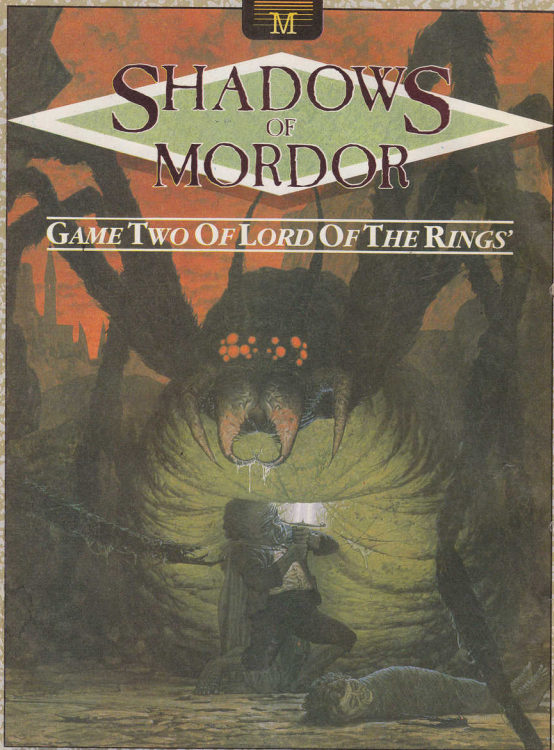
C compilers
Special offers
galore





SHADOWS OF MORDOR

GAME TWO OF LORD OF THE RINGS'



MELBOURNE HOUSE

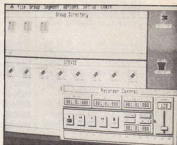
AVAILABLE FOR: AMSTRAD CPC, CBM CASSETTE £8.95 - SPECTRUM £7.95 - CBM DISK £14.95

May 29-June 4 CONTENTS

POPULAR
Computing
WEEKLY

News

- 6 News Desk** Games consoles stagger on to the market.
- 10 News Analysis** In just five years, the computer industry has become a regular bugbear of the Advertising Standards Authority. John Brissenden looks at some of the reasons why.
- 31 Communications** David Wallin has news for E-mail users, and more on Prestel features.
- 33 Soundcheck** Mark Jenkins looks at the Iconix 'music processor'.



Features

- 12 Commodore 64 utilities** Abacus's 1984 range of CAD graph and 'knowledge system' database software has been repackaged and reprinted for 1987. Chris Jenkins reports on how they have stood the test of time.
- 15 Signwriter** Not full-blown desktop publisher, but a 'poster writer' with a wide variety of fonts for PC compatibles and PCs.
- 16 Spectrum Plus 3** The five year old Sinclair Spectrum is undergoing yet another metamorphosis. Its second revamp under Alan Sugar's Amstrad adds a 3 inch disc drive to the keyboard. Chris Jenkins previews the machine and its possibilities.



Programming

- 18 Peek and Poke** Kenn Garroch answers your programming queries.
- 20 Listings** An easier way of accessing printer codes on your Amstrad CPC; the last part of Xen 3 and part three of the machine code monitor Micromon for the Commodore 64. Plus Memory Zap for the BBC, and a program recovery utility for the Memotech.
- 26 Bytes and Pieces** Shake, rattle and roll! Short routines for you to type in, including screen inversion and an unusual screen clearance on the Amstrad CPCs.
- 27 Programming in C** The final part of Kenn Garroch's series on learning C rounds up the matters covered so far.
- 29 Special C offers** If you want to explore the potential of C further, why not take advantage of our special offers for most popular machines?

Games

- 40 New releases** Your complete guide to all the games released this week, including details on Wiz from Melbourne House and Ariolasoft's *Challenge of the Gobots*.
- 41 Hall of Fame** Welcome to the Hall of Fame *Guild of Thieves*, *Magnetic Scrolls'* follow-up to *The Pawn*.



Editor Christina Erskine. News editor John Brissenden. Technical editor Duncan Evans. Production editor Michelle Beauchamp. Supplements editor Christopher Jenkins. Supplements designer Barbara Hajak. Marketing and Advertisement manager David Osen. Advertisement executives Jon Boates, Athena Peerman. Classified executive Susannah King. Editorial secretary Annmarie O'Dwyer. Credit control manager Gabriella Piacina. Managing editor Peter Worlock. Publishing director Jenny Ireland. Published by Sunshine Publications Ltd, 12-13 Little Newport Street, London WC2H 7PP. Tel 01-437 4343 Telex 296275 Fax 01-439 0681. Typeset by Magazine Typesetters, 6 Parnell Court, East Portway, Andover, Hampshire. Printed by McCorquodale Magazines, Andover, Hampshire. Distributed by S.M. Distribution, London SW9. Tel 01-274 8611, Telex 261643. © Sunshine Publications Ltd 1987. ISSN 0265-0509.

ABC

How to submit articles Articles which are submitted for publication should not be more than 2000 words long. The articles, and any accompanying programs, should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here - so please do not be tempted. We cannot guarantee to return your programs - so please do not send your only copy. *Popular Computing Weekly* cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.

Popular Computing Weekly. Tel: 01-437 4343.

Spectrum to QL possible?

I have seen your May 8 issue with its section dealing with the QL.

I would like to ask if it is possible to connect a Spectrum and QL together in such a way that Spectrum software could be made to appear on the QL screen?

There has been mention of this in previous issues, but I cannot find satisfactory details anywhere.

J B Roadley
Coalville, Leicester

We aren't aware of a functioning Spectrum software emulator for the QL, although it should be theoretically possible.

Where to get Oric Software

Where can I obtain Oric Atmos 48K software?

Can any other computer's software run on my machine; maybe Spectrum, as I hear they are similar makes?

P Appleby
Annesley, Notts

WE Software has, we understand, Oric software in stock. Based in Great Malvern, the phone number is 06845 69059.

Similarities between the Oric and Spectrum are largely confined to looks, age and general capabilities, I'm afraid.

You certainly won't be able to get software for other machines to run on your Oric.

Looking around for a graph pad

I own a 48K Spectrum, but I am planning to get a 128K Spectrum later on.

Do you know where I can get a Graph Pad/Sketch Pad for my Spectrum? I have looked everywhere and I can't find one.

I would like to know if a company has written Cobol for the Spectrum 48K/128K. If so, where can I get it from?

F Charalambous,
Mitcham, Surrey

We can't think of any such products currently available (we're not being very helpful this week, are we?). However, we think a Graf Pad was released by a company called British Micro Works some time ago. Over to readers for more assistance.

Welcome to the MUD club

Your readers may be interested to know that a MUD meet is being held at the Novotel in Hamersmith after the Commodore show on June 13. Anyone who plays or is interested in MUD is welcome to come along.

Tickets can be obtained from me at 16 Trinity Road, Barking-side, Ilford, Essex IG6 2BG, priced at £8.50. This includes buffet, hire of suites, personal badge and raffle ticket.

If anyone would like more details (eg, of raffle prizes), they can MBX me on Compunet on HIL1, or Prestel on 219995927, or MUD 2 (persona Chareash).

You can also ring me on 01-518 1745 between 7pm-10pm most evenings.

Simon Lewis
Ilford

Questions and congratulations

Congratulations on your 5th birthday, but why did you have to change the format? It was much nicer with the chunky lettering.

I have several questions to ask, namely: Is there an analogue to digital converter for the Atari ST or any other type of scientific interface?

I use the Fast Basic cartridge, but I can't send any control codes to the printer, which works fine under 1st Word.

When is the next ST Update coming out?

Finally, how about an article on how to produce sound with Fast Basic and a few games listings?

Marcus Marr
Aberdeen

No analogue to digital converter that we know of; we've had no problems with Fast Basic, and it certainly shouldn't interfere with printer control codes (contact Computer Concepts on 0442 63937 to check this out); the next issue of our sister magazine ST Update is due out next week.

We've passed over the suggestion about sound with Fast Basic to STU, and we on Popular welcome listings for the ST, or, indeed, any machine. If your game is good enough, we'll publish it.

Wave that Memotech flag!

Without wishing to repeat what Alan Wilson said in his letter to Popular in the May 15 issue, I'd like to wave the Memotech flag a bit more.

I admit that in the past the MTX 512 did receive poor publicity and suffered from bad advertising, but I am sure that Popular would like to do its best to help keep this branch of the computer world alive. Those computer users not fortunate enough to have access to a 512 don't know what they are missing.

All the popular computers boast about how fast they are at graphics but with the good of Z80A revving away under the bonnet at 4MHz, most things that have to be done on machine code on the likes of the C64, can be done in MTX Basic without loss of speed.

Alan Hamilton
Beith, Ayrshire

Which computer show launched Memotech?

I think that you've boobed somewhat in the Fifth Birthday feature: page 15, May 12, 1983. Surely the Memotech was actually launched at the Earl's Court Computer Fair and not, as you claim, at the London Computer Fair?

I strongly suspect that you've made the all-too-common mistake of getting these two events confused. To recap, the London Computer Fair was run (initially at the North London Poly, later at the Central Hall, Westminster) by LCF Ltd, a wholly-owned subsidiary of the Association of London Computer Clubs, and was a non-profit event.

The Earl's Court Computer Fair (or "the Computer Fair" to give it its official title - see page 17 of the same feature) was run by IPC Magazines Ltd.

There was, of course, considerable anger on the part of the ALCC (whose show had already been running two to three years by 1982) that IPC had usurped their title, especially as IPC's show kept being referred to as the "London" Computer Fair. Perhaps ALCC should have renamed its show "The Original London Computer Fair".

Robert J Baker
London SW4

Further excavation in the Sunshine Towers' vaults has unearthed hitherto unknown manuscripts which, if authenticated, would prove you to be absolutely correct (Popular, June 23, 1983).

Who are the real professionals?

I have often been amused by the letters and articles in many magazines, including your own, about the eternal dispute as to whether or not the Amiga is a better system than the Atari.

I do not wish to enter into this debate as I feel that both systems are good, but I personally considered purchasing an Amiga. After a visit to my local dealer, I sent a letter to Commodore to try to answer some technical questions my dealer could not answer. No reply.

A few months later, during a visit to London, I was able to obtain answers to most of my questions. After the release of the Amiga 2000 system, I wanted clarification on the definition of the screen and details of which Commodore monitors could handle the 640 x 512 display resolution which the sales literature from Commodore insists is available on the UK systems.

In spite of the fact that I commented on the lack of response to my first letter (a copy of which was enclosed with the second), I have still never received any reply from Commodore.

I now think I should take a second look at the Atari. After all, who wants to buy a system from a company which offers absolutely no support at all to the end user.

As a contrast, I feel I should congratulate OkiData for its backup. Within 10 days of writing to Oki in Japan over the problem of its OkiMate 20 colour printer on the Amstrad PC, I received a phone call from their UK agent X-DATA, who assured me that it should have a new utility for colour screen dumps within the next few weeks.

A reply from Japan within 10 days for a product costing under £200, and yet when you are prepared to purchase over £2000 of Amiga from Commodore, it does not reply to letters after three months. Who do you think are the professionals?

Robert Lumsden
West Lothian

In defence of the Amiga A500

Why am I so disgusted? It concerns your continued vendetta against the Commodore Amiga and your editorials being so grossly biased towards the Atari ST.

You're doing a great injustice to your readers who are not going to thank you for persuading them to buy an ST after they've seen what the Amiga is capable of.

Why is *Popular* so biased now? Has Atari promised you a lot of two page colour adverts like the one in last week's issue?

The only real argument anyone can put forward is the amount of software 'officially' available for the ST. Well, even this doesn't stick.

Most of the software available for the ST that's listed by Atari is from the USA where, as you know, the Amiga is more popular. All of this software is also available for the Amiga. I've seen literally thousands of pieces of software for the Amiga.

Jason Hattrell
Woodhall Spa, Lincs

What about the software?

John Brissenden in News Analysis, May 15, fails to mention the vast superiority of

the Amiga's graphics and sound facilities.

He fails to mention the Amiga's sensible software standards allowing easy porting of data between different manufacturers' packages.

He fails to mention the vast superiority of the operating system software itself over TOS.

Finally, he presents his price comparisons in a very biased way. A price list I have received dated April 1987 quotes an Amiga 500 plus colour monitor at £799 plus VAT: £918.85. Only about £100 more than the comparable Atari offering mentioned.

W Plummer
Hemel Hempstead

An all-time classic

The all-time classic is paragraph 10 (News Analysis, May 15). "The STFM and the A500 are, of course, similar in many ways". The only similarities are that they both use a Motorola 68000 and come with 512K of Ram! They do not use the same disc drives, operating systems, support hardware, peripherals, software. Whether this is a good or bad point on each machine is what should have appeared in the review.

Geoff Hatto
Farnham, Surrey
(Letters edited for length)

The editor replies

Let's set a few things straight:

● John Brissenden's piece was never intended to be, nor did it claim to be, a review of either the Atari ST or the Commodore Amiga.

● John Brissenden owns neither an ST nor an Amiga.

● Neither John, nor *Popular Computing Weekly*, has any axe to grind against Commodore, nor a brief to promote the ST.

● We all had a good laugh at the idea that Atari is showering anyone with gifts. It is actually Commodore that is offering journalist's discounts on the Amiga.

● Nobody here knew that Atari would be booking

advertising in *Popular* at the time the article was written.

● A complete, usable system will set you back £825 for an Amiga, £699 for an ST. If you have a colour TV, the entry price for the ST comes down to £399. To those filthy-rich Amiga owners for whom £126 is a sum beneath notice, we can suggest a great many charitable institutions who would take a different view.

● By our best estimate there are approximately 150 software packages available now for the Amiga in Britain. The ST can boast a software library at least twice that size and the ST software base is growing quicker than the Amiga's.

● Many opinions expressed in the article were not John's but those of two of Britain's leading software companies.

● Two minor errors of fact did creep into the article. Yes, the Amiga can accept more than two external disk drives. Yes, the Amiga's memory can be expanded up to 8 1/2 Mb.

The point of the article was not to discuss the technical pros and cons of these two systems (which are comparable in the eyes of most computer-buyers, regardless of loud protestations to the contrary). The point was to discuss which machine looked likely to sell in the UK.

I see no reason to argue with John's conclusion that the ST looks like the winner.

Peter Worlock
Managing Editor

We're sorry but *Popular Computing Weekly* cannot guarantee to reply to all letters requesting a personal answer. It helps us enormously if readers are prepared to have general queries answered on these pages, so, if possible, please do not send SAEs.

Preparing the attack

In Game One of the Colossus Chess tournament, the readers, playing black, have chosen the move Qd5-b5.

This week, Colossus did not attack the black queen again, but is preparing to do so, with its selected move Pb2-b3.

Make your move

What do you think would be the best way to head off this proposed attack?

Send your suggested readers' move to either Inter-Mediate (*Popular Chess*), Freepost, Sawbridgeworth, Herts CM21 9YA (no stamp needed), or *Popular Chess*, Unit 2, The Maltins, Sawbridgeworth, Herts CM21 0PG (with a stamp). Please note that Freepost is slower than the normal service.

All entries must reach either address by June 3.

Prizes

A British Museum reproduction Arran chess set will go to the person suggesting the most accepted moves at the end of the game. Five copies of *Colossus Chess 4* (available for most machines) will go to the most consistent entrants.

Game One

The moves so far:

- | | |
|------------------|--------------|
| 1 P e2-e4 | P c7-c5 |
| 2 N g1-f3 | N b8-b6 |
| 3 B f1-c4 | N g8-h6 |
| 4 N f3-g5 | P d7-d5 |
| 5 R e4xd5 | N c6-a5 |
| 6 B a4-b5+ | P c7-c6 |
| 7 P d5xc6 | P b7x6 |
| 8 R b5-e2 | P h7-h6 |
| 9 N g5-f3 | P e5-e4 |
| 10 N b3-c5 | B b8-c6 |
| 11 P d2-d4 | P e4-d3 |
| | (en passant) |
| 12 N e5xd3 | C b8-c7 |
| 13 N b1-c3 | K e8-g8 o-o |
| 14 P f2-f4 | Q c7-b6 |
| 15 N c3-a4 | Q b6-a4 |
| 16 P d2-c3 | Q d4-d5 |
| 17 K e1-g1 (o-o) | R b8-a6 |
| 18 B e2-f3 | Q d5-b5 |
| 19 P b2-b3 | ? |

Atari set for High St summer games battle

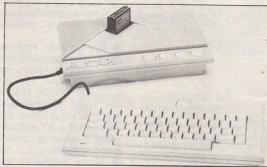
ATARI is set fair for a three-way games console battle with Nintendo and Sega this summer.

The Atari XE games system, including keyboard and cassette, is receiving very heavy advance orders including a \$23 million order from Toys 'R' Us in the United States.

An Atari spokesman was unable to give precise details on the UK position, but there have been rumours of orders worth £220,000 for the new system.

"Atari is in discussion with all the major high street retailers," said the spokesman. It is known that Atari have been negotiating with W H Smith for several months over a retail contract for the system (see *Popular Computing Weekly*, March 13).

WHS recently signed a deal on the 520STFM, which will be



Atari 65XE

in 50 of the company's larger stores from the beginning of June.

Meanwhile the Nintendo console system will finally be available from Mattel from the first two weeks of June.

The entire system - the Deluxe - features the console, the robot Rob, and a zapper gun, as well as two free games: *Duck Hunt* and *Gyromite*.

Prices are undecided yet, but are likely to be as follows:

Deluxe system £159, console £100, Rob £45, zapper gun £20.

There will be about 27 games cartridges available, ranging from £22 to £28.

The Nintendo system will be available through a wide range of national retail outlets, including Argos, Toys 'R' Us, Woolworth, Fenwick, and Littlewoods, Freemans, Grattan and Empire Stores mail order.

The two machines are likely to be in open competition without any immediate threat from the Sega machine.

This was previously due to be distributed by Ariolasoft. That contract has now lapsed, and discussions are understood to be taking place with a number of companies. But for the next few months at least, the Sega has no UK distribution deal.

CBM sets up A500 network

COMMODORE has set up a distribution network for the Amiga A500 to ensure that the machine is available in independent dealers throughout the UK and Ireland after its launch in two weeks' time.

As well as Commodore's regular independent distributors Lightning, Zappo and Hugh Symons, SDL UK will also be

taking on the A500 to distribute to its countrywide network of dealers.

SDL has already been handling the A1000, and will take on the A2000 as well. It also has a software catalogue, mainly US imports, to distribute to retail outlets.

Commodore hopes that dealers will sell the machine not

only as a home computer (Commodore stressed the A500's target market as "upgraders" at its preview in March) but as a business machine, making use of the Amiga's special capabilities in the graphics and multi-tasking fields.

"While Commodore has positioned it as a home computer, we recognise its potential for

business use," said Tom Hart, Commodore's UK consumer sales manager.

The A500 will also be available through high street multiples. A spokesman said, "We cannot comment on individual contracts, but I can confirm that arrangements have been made to sell through a number of multiple stores."

EOA plans not yet AOK

ELECTRONIC Arts' UK plans are suffering long delays.

The US-based company set up a British division in April (see *Popular Computing Weekly*, March 27), but a spokesman said last week that the company wouldn't be ready to

announce details of its UK operations for "a matter of months".

The spokesman put the delay down to negotiations over premises, and said it would be "premature" to make any announcement before final premises were arranged. EOA - as

the UK offshoot is called - is currently based in west London.

When the UK office was opened, plans were announced to manufacture Skyfox, Mule, and the Deluxe range of graphics programs in the UK.

Amstrad and Spectrum con-

versions of existing and forthcoming programs are also expected at some date.

The company's distribution contract with Ariolasoft expired at the end of April, and the current hiatus leaves EOA without a UK distributor.

PLUS 3 WILL GET CP/M

LOCOMOTIVE Software has confirmed that it will be making a full-blown version of CP/M available on the Spectrum Plus 3.

The Plus 3, which was unveiled last week at Amstrad's Brown Goods show (see *Popular Computing Weekly*, May 22), has a built-in disc drive which takes 3 inch discs, the same as Amstrad's CPC 6128 and PCW 8256/8512.

plementation can be produced on the new Spectrum.

"By mid-July, when the Plus 3 is launched, CP/M should be up running on it," said Fisher.

Locomotive's own Malled Basic, which is currently packaged with the Amstrad PCW machines, will also be made available for the Plus 3. This Basic within the machine is essentially a version of the original Sinclair Basic.

SOFTWARE HOTLINES

Starfox from **Ariolasoft** sounds as though it ought to be direct follow-up to Electronic Arts' *Skyfox* and *Arctic Fox*.

"Not exactly," says Ariolasoft. After all, the contract between Ariolasoft and Electronic Arts expired in April when EA set up its UK division to go it alone (see separate item).

Seems that this time the coding has been done by **Realtime**, software heroes of Spectrum *Starfighter* fame.

Appearing on Spectrum, Commodore 64 and Amstrad, *Starfox* features rotating, shaded 3D graphics as you whizz around the galaxies in search of eight planets, blasting the baddies as you go. Expect to see it on the streets in June.

The travesty of *A View to a Kill* notwithstanding, **Domark** is licensed to convert again. The company has got its mitts on the rights to *The Living Daylights*, the forthcoming James Bond romp.

This time it could be big. A new James Bond (pictured below: Timothy Dalton). Furthermore, a James Bond who will concentrate on all-out action rather than romantic toying and fro-ing if the newspapers are to be believed.

Megabucks spent on the movie, and considering the success of Domark's last release *Trivial Pursuit*, megabucks are certainly there to be spent on the game.

Oh yes, the game. There'll be ten levels of action with a 'select your weapon' screen in between. That's cue Q to you.

Then it's off round the world with 007, kicking off in Gibraltar.

If all this sounds familiar, then don't blame Domark entirely. I haven't been able to tell one Bond film from 't'other since *Diamonds are Forever*.

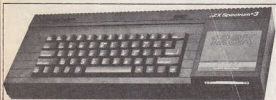
The Living Daylights is due for release on almost any machine you care to think of in July. The film of the same name goes on general release in July as well.

If you thought the adventure scene was looking a bit anaemic these days, **CRL** is out to either change or reinforce all that with the announcement of *Frankenstein*, sequel to *Dracula*.

Dracula, you'll remember, came with the neat publicity stunt of a 15 certificate from the British Board of Film Censors.

Well, they've done it again. *Frankenstein* too is going to get such a rating. And that's not all. The programmers from that downright peculiar software house **St Bride's** are writing a game for CRL based on Jack the Ripper. They're desperately trying for so much blood and guts as to rate an 18 sticker.

The only possible reason for doing this is to incite the under 18s into scoring points off the shop by successfully getting away with buying a copy. And if *Dracula* is anything to go by, I think they'll be disappointed by the gore content.



Locomotive, which wrote the disc operating system for the Plus 3, has written in file compatibility with Amstrad CP/M discs for the machine.

Now, according to Howard Fisher, Locomotive's director of marketing, the company and Digital Research, the original publisher of the CP/M operating systems, has come to an agreement whereby a full CP/M im-

plementation can be produced on the new Spectrum. Later this year, Amstrad is also expected to launch the PCW9512 and PC2512 machines. The new PCW is believed to substitute a daisy wheel printer for the current dot-matrix. The PC2512 will be an IBM PC-AT clone, using the Intel 80286 processor.

● For more details and a preview of the Spectrum Plus 3, turn to page 16.

Schools face crisis over BBC spare parts

ACORN Computers has informed the Department of Education that it will stop stocking spare parts for the BBC machines in 1991.

Acorn's policy is to keep parts for up to five years after the manufacture of the particular machine has ceased, so the deadline appears to have been stretched. Production of the BBC stopped in 1985.

There are about 250,000 BBCs and BBC Pluses in

schools throughout the UK, and educational establishments cannot afford to update their micro technology.

Consequently, almost all the BBCs placed in schools, four years ago or so, are still in use.

The news has led to two educational authorities, Bedfordshire and Kent, already beginning to stockpile old BBCs to use for parts when they become difficult to obtain.



NEXT
WEEKSPECIAL
supplement

The BBC

The BBC may be a veteran computer, but there's no shortage of new products being released for the machine.

In our supplement, we'll be looking at the Quest mouse and paint software from Watford Electronics, more application programs from Computer Concepts in the shape of *Inter Chart* and *Spellmaster* and desktop utilities from DMS.

Then we've got music software from Hybrid Technology and Peartree, and all the latest games, from Tynesoft, Micropower and Bubble Bus, to name but a few.

First steps in
machine code

Kenn Garroch begins a new programming series, with guidelines on how to get started with machine code.

Compunet

Graham Edkins brings you another of his regular updates on the Commodore network.

General election

We can't let the part-leaders get away with all the limelight, so for those of you not already bored stiff with the forthcoming event, we're muscling in on the act.

General Election is a board game style listing for the Spectrum. The object? To get to Number Ten, of course.

Readers' survey

Have your say in *Popular* by filling out our questionnaire and letting us know what you think.

Multi-user game for Compunet

COMPUNET will be introducing a new multi-user space game this July, once its new main-frame comes on-line.

Called *Federation II*, the game can handle up to 128 players at once, with up to 2,500 locations depending on the number of players.

In true adventure tradition, *Federation II* will offer hundreds of locations to explore, puzzles to solve and treasures to find.

Players are also given the

opportunity to build up trading empires in the galaxy's commodity markets, run the economy of their own planet or engage in political plots or inter-planetary warfare.

In way of introduction, a free on-line demo of *Federation II* is available now to those with any teletype software and a modem. The demo is a single-user version running on a PC, with 130 locations and a limited vocabulary and action set.

There will also be a Federation bulletin board for your messages and comments.

The hours of operation for the demo are between 8.00pm and 8.00am during the week, and all day over the weekend. (No protocol, 8 data bits and one stop bit, 300/300, 1200/1200 full duplex or 2400/2400. Ring 01-965 2989.)

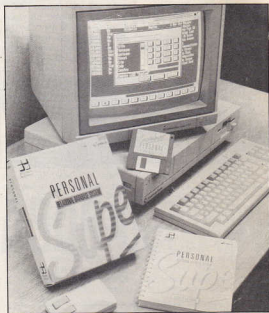
Compunet plans to open *Federation II* to all modem owners on any micro in the autumn.

£50 cut
for Amiga
Superbase

THE Amiga version of *Superbase Personal* is to be slashed in price by £50. Publisher Precision Software announced the move in a bid to net new customers following next month's launch of the A500.

Precision claims it has sold 13,000 units of the relational database package in its Amiga version, with healthy sales in PC and ST versions as well.

Now reduced from £149.95 to £99.95 inclusive, *Superbase Personal* will be available at the Commodore Show, where the A500 will make its public debut.



Tai-pan comes out of Ocean

OCEAN releases one of its most ambitious projects to date next month: *Tai-Pan*, a tale of buccaneering off the Chinese coast, based on the James Clavell novel.

Ocean plans to release *Tai-Pan*, which has been in development for the past nine months, over a wide spread of machines, but the Atari ST and Spectrum versions are due out first, in June.

You play the hero Dirk Struan, aiming to get rich by trading



commodities in the Far East. The game includes trading elements, arcade adventure sections a fair amount of blasting.

Tai-Pan will cost £7.95 on



Atari ST Spectrum, £19.95 on the ST. The later Commodore, Amstrad and MSX versions will cost £8.95 tape, £12.95 C64 disc, £14.95 on Amstrad disc.



FALCON

THE RENEGADE LORD



£9.95

This superb arcade game is based on the popular multiple-choice adventure series by Mark Smith and Jamie Thomson, published by Sphere Books. Set in 3033 AD you are a special agent, codename **FALCON**, and your mission is to halt the tracks of a renegade Time Lord who is threatening to disrupt future history by his ruthless meddling in the past. Your time machine "Falcon's Wing" takes you in your quest to ensure the timelines of the future remain uncorrupted!

Please send me **FALCON: The Renegade Lord**

Commodore **64/128** ☐ Spectrum **48/128** ☐

I enclose a cheque/postal order made payable to **Virgin Games**
and crossed

Total £ _____

(Please do not post coins or notes.)

Name _____

Address _____

Postcode _____

Virgin Games, 2/4 Vernon Yard, Portobello Road, London W11 2DX

LEGAL, DECENT

The controversy over Sir Clive Sinclair's Z88 portable is a typical example of the terrible record of the computer industry when it comes to complaints about advertising. John Brissenden investigates.

Just five years the computer industry has moved from nowhere in the records of the Advertising Standards Authority to number three in the 'most complained about' charts!

The ASA 'top three' for 1986 contains the stalwarts Holidays and Cars at numbers one and two (Cars slipping from the number one slot).

There were 121 complaints lodged against holiday advertisements, 115 against car ads, and then comes computers, with 85 protests.

The majority of advertisements causing complaint have been

those for hardware and peripherals and the claims they make for the products, although software release dates have made a recent appearance.

To cite just a few of the complaints lodged with the Advertising Standards Authority over the last two years: Acorn went through a bad patch a couple of years back over claims of compatibility between the Compact and BBC Bs, and claims about the size of Ram in the BBC.

Amstrad has also run into problems recently over advertising for the PC1512s. A press

advertisement stated that the PC "uses all the same famous software that the IBN PC can use". The complainant questioned the validity of this on the grounds that the PC1512s do not run Basics under PC DOS.

Amstrad has also fallen foul of insufficiently stressing its quoted price of £450 was exclusive of VAT in its "How much computer can you buy for £450?" Both complaints were upheld.

time that there was no delivery date mentioned, and Sir Clive was asked to stop advertising it.

What is remarkable is that anticipating release dates, and missing them, is signally unremarkable nowadays. Indeed the industry as a whole has become notorious for broken promises, and unfulfilled orders.

To such an extent that the most profitable company in the world, IBM, can "launch" its



THE SINCLAIR SYNDROME: The QL...

However, both these examples pale into insignificance when compared with the record of one Sir Clive Sinclair. The Spectrum QL, and the Sinclair C5 electric vehicle in abundance, have all cropped up in ASA reports from 1984 onwards.

Other appearances on the ASA 'black list' have included Data Technologies (over a non-available upgrade to the BBC), Viglen Computer Supplies, Toshiba (overstating comparison of sprite capabilities in the MSX with other machines), Micro Peripherals (estimate of print speeds), and Dixons.

Nine complaints about computer companies, or computer repair services, appear in the ASA's latest quarterly report alone.

We have seen in recent months a recurrence of the Sinclair syndrome. Sir Clive has once again advertised a product - the Z88 portable - which is so far unforthcoming. The ASA remarked on the fact at the

new series of personal computers virtually a year before it, and its new operating system, will be on sale. Nobody was that surprised, and the most adverse reaction was that some commentators thought it 'a mistake' and 'a shame'.

However, you could say this is a 'no win' situation. Amstrad made not a few people disgruntled 18 months back when the CPC6128 appeared in the shops a week or so before the machine was launched. The disgruntled, you'll remember (particularly if you were one of them) were mainly CPC664 owners.

In 1984, the Authority's Annual Report showed that it had received 92 complaints about computers or related products. This compared with 89 about financial services (banks, building societies, etc.) and a staggering 151 about the motor trade.

By 1985/6, the figures were: computers 85, financial 52 and motors 115, as quoted above. In other words, among the top



AND HONEST?

three or four industries for complaints about advertising, the computer industry has zoomed in from nowhere.

It is also worth noting that the financial services market and car industry are considerably larger than computers.

The authority is obviously well aware of this state of affairs, and has conducted some limited research into it. In its Case Report 144, dated 15 April 1987, the ASA reported:

"We asked a random selection of (computer software) advertisers to prove to us that they were able to supply the goods they advertised. We found that approximately a third of the advertisers we contacted admitted to having current problems... which affected their ability to supply the products

advertising, regards much software and peripherals development as a 'cottage industry'."

So the best explanation appeared to be something akin to the 'back bedroom' syndrome: starts off happily as small one-person business, expands very fast, subsequently programmer/electronics enthusiast does not have experience of running a growing business.

This doesn't really stand close attention. The description barely fits any of the examples quoted above, and the number of computer companies still in the hands of the 'back bedroom' individual has shrunk to a very small proportion of the whole.

More likely is the first part of the extract. New products to complement/enhance the cur-

them to make more vigorous efforts."

This brings us to one of the main criticisms, or drawbacks, or stumbling blocks, or assets (depending on your point of view) of the ASA. It has no legal power to enforce its conclusions. It can advise, chide, throw out or uphold complaints.

It can pronounce companies guilty of breaking the Code of Advertising Practice, and can seek assurances from the advertiser concerned that the matter will be rectified and won't occur again, but, so far, computers - and yes, companies involved in cars, holidays and financial services - are still black sheep.

An ASA spokeswoman gave her thoughts on possible legal measures.

"The law takes years to operate, doesn't it? Besides which new industries like the computer industry defeat them, and so the law has to be updated."

A further advisory measure, the Directive on Misleading Advertising, is currently being worked on by the Office of Fair Trading and the Department of Trade and Industry, in conjunction with the EEC.

But the General Election has put that back by months.

So, for the moment, it is up to customers to report complaints to the ASA, and to those responsible for accepting advertisements to ensure, as far as possible, that the advertisement is reliable before being accepted for publication or broadcast.



... and the Z88 were both advertised before they were available.

they had advertised."

Back in 1984, the ASA was wringing its hands over the issue, trying to suggest reasons for the problems connected with the computer industry.

"... the problem is the outcome of the fast and furious growth of the market and the chaos that has attended it... Today's advertisers range from the large and well known computer manufacturers and marketers to the bright lad who devises saleable programmes (sic).

"The ASA Cases Officer who has dealt with a number of the complaints about computer

rent stock are always on the go, they need to be released before someone else gets in first, and so the expected time of arrival gets more and more optimistic.

This is true of software release dates, which have recently attracted the ASA's attention, after a considerable amount of confusion last year, with several titles advertised before being ready for release.

Earlier this year, the authority contacted a number of software advertisers and found that around a third had problems with supplying products by the time advertised.

The authority "requested

Sign of the times for the Amstrad PCW

Tony Kendle reviews a new type of desktop publishing package especially for use on signs, posters and other advertising-type things.

Over the last year there has been a boom in the number of desktop publishing programs of varying sophistication.

In most cases, 'print quality' pages are really only possible with the use of laser printers way beyond the pocket of most micro users. But even the most crude DTP programs and cheap dot matrix printers have together proven themselves to be invaluable for producing fanzines, newsletters, posters and signs.

Signwriter is a simple text font and graphics printer that is capable of producing signs, posters, letter headings, calendars, tickets and, to a limited extent, newsletter pages.

Text can be centred, justified or flush with the left and right margins, but beyond that the program provides almost no formatting options such as tabs or columns. Nor can it import text from word processors unless this is first surrounded by some rather complex internal control numbers designating print size, etc.

However, the program is really an extremely clever piece of work that allows the user to, almost effortlessly, produce output

that is completely flexible in size.

It works by defining the outline of each character in terms of a complex of linked curves and lines rather than as a matrix of dots; the technical term is a vector design. The outline that is so determined can be then mathematically scaled to any size, in millimetre steps, and the printout is automatically calculated and adjusted to maintain the highest possible resolution.

This method is rather more demanding than, say, with *AMX Pagemaker*, but it is possible to produce quite complex type styles, graphics, logos, etc, and to prove it there is a file of animal pictures.

There were six font files provided with the demo package (although one provides just scientific and foreign characters) and another four are close to release. All extra fonts cost just £5 plus the cost of a disc.

Once designed, different fonts can be merged together. Such hybrid fonts can then be used to produce more complex output with possibly several apparent changes in type style across one line. The only real limitation is the complexity of the individual characters, and the number of characters in the line, which can in

extremis exceed the processing power of your computer. In this respect PC users can be much more adventurous than those with either a BBC or PCW.

Entering the text of your 'sign' is a very easy process. You can define maximum height of each textline, the gaps between the lines, the spacing between individual letters, the sign width, and so on. Blocks, boxes and lines can be added for a completely professional output.

The sign text can be orientated horizontally or vertically on the page. Photo reduction of the output improves quality.

It is not possible to view a graphics representation of the resulting sign before printing, but a fast draft mode print is provided for dummy runs to allow final adjustments.

As well as dot matrix and laser printers, *Signwriter* is being adapted to drive plotters and even metal cutters. Many useful features are included in the program, such as the ability to reverse a sign so that it can be used to produce transfers for T-shirts and to add sequential numbers to tickets.

The PCW version only supports the supplied printer, and works much more easily on a machine with expanded memory or two disc drives, but is perfectly usable on the normal £256 if you do not mind a little disc shuffling.

The graphics display for the font design is particularly slow on the PCW, which is attributed to the fact that the Amstrad video display is not documented, forcing the programmers to use the creakingly slow GSX routines.

Wight Scientific's documentation is entertaining, to say the least - *Signwriter* came with a positive fistful of updates and explanatory leaflets. The program is undergoing constant revision and purchasers are entitled to claim one upgrade free and subsequent ones cost £5.

I was highly impressed with *Signwriter*, and even more so with the intelligent, way it was presented and documented.

NOW IS THE TIME
FOR ALL GOOD MEN
TO COME TO
THE AID
OF THE PARTY.

Not a party political message, but a screen dump from *Signwriter*.

Program *Signwriter* Micro PC compatible £80, Amstrad PCW £49.95, BBC B £29 **Supplier** Wight Scientific, 44 Roan Street, London.

THE MAIL ORDER SOFTWARE SOCIETY
**'THE BEST THING
 SINCE SLICED BREAD'**

'Try Before You Buy'

GAMES FOR

SPECTRUM - MSX - AMSTRAD - COMMODORE
 BBC - ELECTRON - ATARI

IT COSTS NOTHING TO FIND OUT

Send your name, address and which computer(s) you have to:

(No stamp required)

M.S.S.

FREE POST, P.O. Box 57, Doncaster,
 South Yorkshire DN4 5BR

SHAKE

£1.99

CRASH

£1.99

REVIEWS

**NEW
ADDITIONS**

**OLD
FASHIONS**

SHAKE

£1.99

THE POP MUSIC MAGAZINE ON CASSETTE FOR YOUR SPECTRUM 48K/128K

SHAKE CONTAINS THE LATEST NEWS AND INFO FROM THE POP-MUSIC
 WORLD... PLUS... RECORDED MUSIC IN SOUND AND VISION!!

NEW EDITIONS REGULARLY ISSUED!!
 NOW AVAILABLE FROM YOUR LOCAL SOFTWARE SHOP!

If you have difficulty obtaining your SHAKE then send a cheque or postal
 order for £1.99 to SHAKE, SUITE 3.2, DEPT. P.C., EPIC HOUSE,
 CHARLES STREET, LEICESTER LE1 3SH. Postage free within UK Europe
 and Eire add 30p postage. Rest of the world add £1.20 for airmail
 delivery. Issued by KEEP PUBLISHING. Tel: (0533) 511734.

IS IT A GAME? IS IT A UTILITY? NO!! IT'S SHAKE!!

AMSTRAD PCW JOYSTICK INTERFACE



Explore the games capability
 of the AMSTRAD PCW 8256/8512.
 Our dedicated interface plugs
 into the expansion port of the PCW.
 Supports a wide range of standard joysticks.
 Compatible with Tomahawk, Strike
 Force Harrier, Strike
 and new releases
 from leading software houses.
 Price £14.95 inc VAT, P&P.

Also available complete with the
 new WICO BLACK MAX joystick
 for only £24.95 inc VAT, P&P.

Kempston

Cheques, P.O. to PANDORA MARKETING
 22 Linford Forum, Rockingham Drive,
 Linford Wood, Milton Keynes MK14 6LY
 Tel: 0908 690018

IT'S HERE AT LAST!

**The show that tells you
 everything about the
 exciting world of
 Commodore computing!**

- ★ Test drive the very latest
 games in the Commodore
 Games Arcade.
- ★ Join in live demos of the new
 generation of computer music.
- ★ Browse through the library of
 business software in an
 adults only section.
- ★ Meet Jim Butterfield
 and many other top
 experts in the
 Commodore theatre.

**SAVE
 50p**

**10th Official
 Commodore
 computer show**

10am to 6pm Friday June 12
 10am to 6pm Saturday June 13
 10am to 4pm Sunday June 14

**Champagne Suite & Exhibition Centre
 Novotel, Hammersmith, London W6**

Bring this coupon to the Show to get 50p per person off the
 normal admission price of £3 (adults), £2 (children).

Valid for up to four people.

10th Official
Commodore
 computer show

Friday, June 12, 10am-6pm
 Saturday, June 13, 10am-6pm
 Sunday, June 14, 10am-4pm

**Champagne Suite & Exhibition Centre,
 Novotel, Hammersmith, London W6.**

Nearest Tube Station: Hammersmith

Ample car parking nearby
 POP SA



Evesham Micros

SPECIALIST COMMODORE PRODUCTS

THE star
PRINTERS FOR BUSINESS

NL-10

WHICH MAGAZINE
BEST BUY



- Automatic single sheet handling
- Tractor feed built in
- "Front Panel" mode selection
- Double and Quad height characters
- 120 cps draft and 30 cps NLO

This is the best Commodore ready printer you can buy. Combines many unique features with superb reliability, styling and print quality. But the real beauty is that the interface cartridge is interchangeable so if you change comp-users just buy a new interface.

In a group test with other popular printers such as Epson, Citizen and OKI where Micro magazine described the NL-10 as 'the Rolls Royce of this group'. **ONLY £249.00**

Automatic cut sheet feeder available as an option for £63.25

SELECTED PRODUCTS

SEIKOSHA SP 180VC

A new Commodore ready printer that offers both friction and tractor feed combined with NLO ability. Print speed is 100cps in draft and 16cps in NLO.

ONLY £189.95

1541C DRIVE. The latest version of the 1541, colour drive mechanism and new colour **ONLY £189.95**

DISC NOTCHER. Double the capacity of your discs with this handy gadget. Cuts second write protect notch accurately and easily **ONLY £5.95**

AZIMATE 3000. Handy package allows you to easily check and realign the tape head of your CBM data recorder. Includes screwdriver **ONLY £6.95**

MOTHERBOARD. 4-slot, with either all upright sockets, or three upright and one through socket. To suit modern, please specify **ONLY £28.00**

POWER PACK. High quality replacement power pack for CBM 64 **ONLY £24.95**

XETEC SUPERGRAPHIX. The best centronics printer interface for your 64/128. Large buffer, downloadable fonts, etc. **ONLY £69.00**

DATA RECORDER. CBM compatible, same performance as the C2N1531 but cheaper and includes a pause button **ONLY £24.95**

Large stocks of Commodore-related equipment at sensible prices. If you don't see what you want, give us a call.

DISKS AND BOXES

25 pack packed 5-Disk disks with wip. bob and label **ONLY £13.95**

25 disks as above with 50 capacity lockable box **ONLY £22.95**

25 disks as above with 100 capacity lockable box **ONLY £24.95**

50 capacity lockable box **ONLY £10.95**

100 capacity lockable box **ONLY £13.95**

THE EXCELERATOR +



For COMMODORE Computers

Why buy a 1541C when you can buy this neat, reliable and compact drive for less money?

FEATURES

- Handles Disc Turbos
- Direct Drive Motor
- 1 Year Guarantee
- Ultra Compatible
- External I/O Switch
- Very Reliable
- Compact Size
- Very Quiet
- Dueton 1 Overheat
- 26% Faster

ULTRA
COMPATIBLE

Tests have shown the Excelsator to be more compatible with protected software than the CBM 1541C. We can't find any software that it will not load.

TWO PURCHASE OPTIONS —

DON'T BUY A LUMBERING HIPPO (1541C)!

THE EXCELERATOR+ OFFERS MORE FOR LESS MONEY

SPECIAL
INTRODUCTORY
PRICE
ONLY
£159.95

COMBINATION OFFER
EXCELERATOR+
and
FREEZE FRAME MK IV
ONLY **£179.95**

THE SLIMLINE '64

A NEW IMAGE FOR
THAT FAVOURITE
COMPUTER

- Easy to Fit
- Lower key height

This modern case with it's sleek style will transform your '64. The high quality injection mould is superbly finished in the latest ivory colour. The lower key height is also a boon to operator comfort. Fitting is very simple, requiring just a Phillips screwdriver, and can be completed in less than 10 minutes. Stock now available so order for quick delivery.



Only
£19.95

DOLPHIN DOS

THE EFFECT IS STAGGERING.

Now established as THE parallel operating system for the 1541 disc drive. Hundreds of satisfied users include business, hobby, full-time programmers, and many leading software houses, including Gremlin Graphics, Demark, Superior, Alligata, Thalamos, Adventure International, and Software Projects. The speed and efficiency is truly unbelievable. It is compatible with the vast majority of commercial software, speeding up both the loading of the program and of SEQ/REL files. (It is brilliant with Superbase, EasyScript, etc.) For non-compatible programs it can be completely switched out. It DOES NOT use a special disc format and your existing disks will be compatible.

FITTING

Fitting involves the insertion of two sub assembly circuit boards, one in the 1541 and one in the 64/128. These normally just plug in but on some 64s a small amount of soldering is necessary.

SOME OF THE FEATURES

- 25x FASTER LOADING (PRG FILES)
- 12x FASTER SAVING (PRG FILES)
- 10x FASTER LOADING (SEQ FILES)
- 8x FASTER SAVING (SEQ FILES)
- 3x FASTER LOAD/SAVE (REL FILES)
- E.G. LOAD 202 BLOCKS IN 5 SECS
- EASY AND FAST DOS COMMANDS
- USE 40 TRACKS FOR 749 BLOCKS
- MONITOR BUILT IN
- DRIVES CENTRONICS PRINTER
- ENHANCED SCREEN EDITOR
- EXTRA BASIC COMMANDS

(These figures do not allow for searching)

EXTRAS AVAILABLE

- Kernel for 128 in 128 mode
- User port expansion card (3 slot)
- Dolphin Copy (Whole disc in 18 secs and lightning fast file copy)
- Dolphin main board for second drive c/w lead

If you require further information, please send SAE for fact sheet

69.95
£14.95
£7.95
£44.95



Best Hardware
Utility of year

Only
£69.95
Available for CBM 64,
or 128 in 64 mode,
please specify.

ORDERING INFORMATION

ALL PRICES INCLUDE VAT AND FREE DELIVERY WITHIN U.K. (Despatch within 24 hours whenever possible)

Send cheque, P.O. or ACCESS/VISA details to our Evesham address. Call our Evesham branch and quote your ACCESS/VISA details

EVESHAM MICROS, 63 BRIDGE ST, EVESHAM, WORCS. WR11 4SF

Callers WELCOME Tel: 0386 41989 Telex: 333294

TRADE ENQUIRIES WELCOME

Also at: 1756 Pershore Road, Cotteridge, Birmingham B30 3BH. Tel: 021 458 4564

All items subject to availability. E.S.O. E. Orders from Government and Educational departments welcome. Overseas Orders: Within Europe, please send advertised price. Outside Europe, add £2.00 for Air Mail



By Post

HOW TO ORDER

By Phone



A trio for your Commodore

Chris Jenkins reviews three new packages for the Commodore 64, including *Xper*, one of the new breed of "Knowledge-based expert systems."

Knowledge-based expert systems are as much a current fad as, say, desktop publishing. In effect, the concept involves transferring the knowledge of an expert on to a database program, which can respond to questioning with meaningful answers.

While a database can only retrieve facts, the function of an expert system is also to derive new knowledge from the facts provided. For instance, quoting from one of the examples included on the disc, a conventional list of African felines – tiger, lion, jaguar, puma – may well contain details about their environment and habits, which can be accessed and sorted. Only an expert system, though, can deduce by comparison that "all free-climbing African felines have retractile claws".

What you can get out of *Xper*, a 1984 vintage now repackaged by Abacus Software, depends on what you put into it, as with all similar systems.

The Editor section allows the creation of lists of objects (tiger, lion, jaguar), features (fur, habitat) and attributes (stripes, breathing underwater). The enquirer then allows you to cross-question the database to check whether the system makes sense.

While the defined knowledge base can be illustrated graphically as a grid, more useful is the ability to search out objects by defining their attributes; for example, you can work through the enquiry routine, which displays counters of the question number, number of remaining features left to interrogate, and number of objects left not eliminated.

Given enough information about markings, size, weight, and habitat, for instance, *Xper* can work out that the mottled, six foot, 100 kilo plains-dwelling feline which just bit your foot off was a cheetah.

Xper can produce unique solutions, lists of solutions, or deduce that there is no solution to a given problem; according, of course, to whether you entered the correct information in the first place. If an attribute is unknown, it can be entered as such; you can also use "father-son" attributes, which bring up sub-menus in response to certain answers to the main attribute section.

Also available from Abacus in a new box is *Cadpak 64*, another 1984 oldie. This one has not stood the test of time so well.

Your first shock will be discovering that this disc-based package can be controlled only with a light pen (£12.95 extra) or cursor keys. Joystick? No way. Mouse? You've got to be joking!

The next shock to the system is the

printer installation routine. One would expect a simple menu, a choice of printers, and on with the design work. Not so. In order to install your printer, you have to go through a routine which is as harrowing as a visit from the Spanish Inquisition.

Using the *SIZE* routine, the program prompts you to select your printer and interface type from a wide range, then proceeds to print out two boxes, the X and Y dimensions of which you have to measure – like, with a ruler, man – and enter into the program. This took a staggering 20 minutes on my MPS-801.

Having set up the printer, you can move through the main menu to the drawing screen, and things get better. Here it's possible to enter points either by typing in co-ordinates, or by positioning them on the screen with cursor or light-pen. Positions can be absolute, or relative to the last point.

Lines can also be drawn continuously, vertically, horizontally, parallel to last, at right angles or as rays from a central point.

While *Cadpak* has many of the attributes of a conventional drawing package, it lacks the extra touches like definable brushes and pens, colour cycling, airbrush shapes and so on. As a CAD package, it lacks any attempt to introduce 3-D effects, or the ability to overlay designs. In other words, it's showing its age.

Chartpak is similarly unwieldy: in order to load and print out a bar chart, example, I had to perform around 30 keystrokes; selecting DATA FILES from the main menu, defining the file-type, selecting data sets, loading specification files, setting the disc and printer device numbers, and so on.

Graphs are produced by entering numerical data, either

in one- or two-dimensional arrays. Data from *Multipan*, *CalcResult* and *BusiCalc* can also be used.

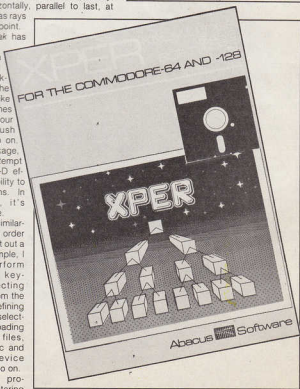
Labels, base values, divisions, and chart types can also be defined and edited; there are seven sorts of charts available, including pie, bar and comparison types.

Suffice it to say that while *Chartpak-64* can produce some very complex and professional-looking results, rivals such as *Database's Mini Office* are far easier to use and offer enough facilities for most non-professional computer users.

Programs *Cadpak-64*, *Chartpak*, *Xper*, *Micro CBM 64*, 128 versions with higher screen resolution also available.

Supplier Adamsolt, 18 Norwich Avenue, Rochdale, Lancs OL11 5JZ, 0706-524304.

Price £24.95, C128 versions £34.95.



Xper: can respond with meaningful answers.

PLUS THREE, MINUS TAPE

Chris Jenkins takes an advance look at the new Spectrum Plus 3 – this time with a built-in disc drive.

Five years on, and at last the Spectrum gets what it really needed in the first place; an efficient, standard, built-in mass storage unit. The Spectrum Plus 3 has been unweilded, offering (yet another) new lease of life to a perennial favourite.

Sir Clive Sinclair's alternative to cassette, the notorious Microdrive, was never really in the running as a serious storage option. Based on unreliable floppy-tape cartridges, incompatible with any other operating system known to mankind, it failed to establish the Spectrum in any real sense as a "serious" machine.

While excellent alternatives like the Opus Discovery made some headway, without an official manufacturers' standard for disc storage, the software revolution required could never happen.

It took an Alan Sugar to make the obvious step of bolting Amstrad's disc system to Sinclair's computer, creating a machine which – if the price was right – might revitalise the UK's 6-bit market.

The Sinclair ZX Spectrum Plus 3 128K, to give it its full title, contains a few surprises. But it's enough that the final step has been taken, and the built-in disc drive can now prompt a change in attitude toward Spectrum software.

Completely redesigned internally, externally the machine looks very much as one might have imagined; the keyboard remains the same, a 58-key full-travel unit with only the major Sinclair Basic functions – LOAD, RUN, CODE – marked in addition to the query symbols.

To the right, replacing the Plus 2's cassette deck, is an Amstrad-type 3 inch

"The Sinclair ZX Spectrum Plus 3 128K, to give it its full title, contains few surprises. But it is enough that the final step has been taken, and the built-in disc drive can change the attitude to Spectrum software."

disc drive. The case is finished in matt black, and is slightly deeper and chunkier than that of the Plus 2. The power-on light remains between the keyboard and the drive, while the drive itself features an operating light and disc eject button.

Some major changes are found in the line-up of ports at the rear of the machine. A Centronics compatible parallel printer port has been added, fully supported from the new Plus 3 Basic. For the first time the Spectrum can be connected directly to quality printers without special interfaces or non-standard cables.

In addition, the rear of the machine boasts a UHF output for TVs; RS-232C "Midi" port; external power supply socket,

auxiliary disc interface; RGB output; audio out/cassette in port; and the standard expansion I/O connector. The two Amstrad SJS-1 joystick ports and the reset switch are to the left of the machine; there's still no on/off switch.

The Plus 3, then, offers the convenience of a built-in disc drive; can be connected to extra disc drives and a wide range of printers; has a proper keyboard, 128K memory and the improved Basic and sound facilities of the Plus 2, and can still be used with tape software. It begins to sound suspiciously like a good machine.

Most important for the potential buyer, of course, are the capabilities of the disc drive. It's a single-sided 3 inch device using the 40 track, nine sector, 512 bytes per sector standard Amstrad discs; total storage, then, to save you the calculation, is around 350K per disc.

Although the disc operating system is CP/M compatible, it doesn't appear likely

"Most important for the potential buyer, of course, are the capabilities of the disc drive. It's a single-sided, 3-inch device using the standard Amstrad discs."

that CP/M programs can be run on the Plus 3. It's more the case that it is possible to read data files generated with other CP/M machines, such as the Amstrad PCW; useful enough in itself.

Obviously, Sinclair Basic (now Plus 3 Basic) and the Plus 3's operating system have had to be revised to take account of the disc system. Most old Basic programs should run without modification.

On powering up, the screen now displays the copyright notice "© 1982, 1986, 1987 Amstrad PLC, Drives A: and M: available"; and four options; **LOADER**, **Plus 3 Basic**,



Amstrad's Spectrum Plus 3 with built-in 3-inch disc drive

Calculator and 48 Basic.

Default, then, is disc loading, which can be performed from the built-in drive, auxiliary drive, or the volatile Ram disc area. Loading from tape can now only be performed by going into Basic.

The question remains, what will be offered in the way of software? The initial package consists of six expanded Ocean games: *Supertest 1*, *Supertest 2*, *Cosmic*

great man's lead, while others speak of reduced profit margins and increased development time. Doubtless the quality of serious Spectrum software can only improve with the advent of the standard disc drive.

At £249, including the joystick, manual and six-game disc, the Plus 3 is priced highly enough, to make the £149 Plus 2 still a viable proposition.

One problem is that while owners of the Plus 3 can use Amstrad FD-1 additional disc drives - £110 with the connecting cable - this option is not open to Plus 2 owners.

The differences between the machines are so major that it's impossible to connect the Plus 2 to the Amstrad disc drive. Existing Plus 2 owners are blocked from upgrading to disc without selling their existing machine and starting from scratch

with the Plus 3, and a cassette deck to load their tape software. Many Plus 2 owners will be furious; but, in the words of Alan Sugar, "Pan Am takes good care of you, Marks and Spencer loves you, Securicor cares... at Amstrad we just want your money."

Undoubtedly a well-conceived machine, it remains to be seen whether the Plus 3's pricing makes it an attractive purchase for existing Spectrum owners or computer neophytes.

Over the next few weeks we'll be considering the issues raised by the Spectrum Plus 3, such as compatibility with the small number of 128K Spectrum programs already released, the options for Spectrum Plus and Plus 2 owners, and the plans of the software houses. We'll also be looking at the new Basic and DOS in more depth.

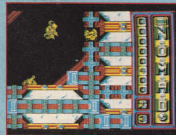
"Undoubtedly a well-conceived machine, it remains to be seen whether the Plus 3's pricing makes it an attractive purchase for existing Spectrum owners."

Wartoad, *N.O.M.A.D.*, *Gift of the Gods* and *Mailstrom*. Each takes advantage of the 128K available in the Plus 3, and benefits from the faster loading times - up to 50 times quicker than tape - of the disc drive.

None, though, use the continuous disc access principle which could allow Plus 3 programmers to create powerful utilities or adventure-type games of enormous depth and complexity.

Alan Sugar's intention is to create a market where blank discs cost around £1, and games software is released mainly in the form of compilation discs at less than £10. Software houses have mixed feelings about this: some are willing to follow the

The Plus 3 keyboard: only the major Sinclair Basic functions are marked in addition to the qwerty symbols.



Supertest and *N.O.M.A.D.*: two of the games bundled with the Plus 3. Above right: the new, black look of the Spectrum.



with Kenn Garroch

Text handling

A Duckworth, of Royton, Lancs, writes:

Q I am writing an adventure program that needs to handle text. The problem is that I need to convert all input to upper case. Is there an easy way of getting upper case from lower case?

A As it happens, there is a really easy way. Consider the Ascii codes of A and a, 65 and 97. In binary these are 01000001 and 01100001 with the only difference being the 6th bit set to one for lower case.

So to convert from lower case to upper case simply AND the Ascii value with 255-32 or 223. This simply sets the sixth bit to zero making the character upper case.

The only drawback is that the space character is 32 and hence becomes zero through this operation. Similarly, punctuation marks and numbers are altered wrongly so these have to be skipped.

Fortunately, the characters to be converted are in groups. Lower case characters start at 97 with 'a' and go to 122 with 'z'. Anything outside of this range should be ignored. A subroutine along the following lines should do the trick:

```
1000 US=""
1010 FOR T=1 TO LEN(S$)
1020 IF ASC(MID$(S$,T,1))>97 OR
ASC(MID$(S$,T,1))<122 THEN
US=US+MID$(S$,T,1):GOTO 1040
1030 US=US+CHR$(ASC
(MID$(S$,T,1)) AND 223)
1040 NEXT T
1050 RETURN
```

L\$ holds the string to be converted.

The routine puts the new string in US.

Routine registers

Peter Breeze of Huddersfield writes:

Q I have recently begun to learn machine code on my Spectrum and was managing quite well when the book I was reading gave me the following small routine to enter into my machine. The routine was as follows:

```
PUSH AF
PUSH BC
PUSH DE
PUSH HL
LD E,A
LD C,02
CALL 0005
POP HL
POP BC
POP AF
RET
```

The first four lines save all the registers and the fifth line places the contents of the accumulator (which holds the code of the character to be output) into the E register. The next line I understand but do not see the point of. The next line (the all important line) calls another of the computer's routines, and the rest of the lines restore the registers.

When I came to run this routine, I found that it did not work. The book tells me that this is because my Spectrum does not operate under the 'Control Program Monitor' system and I would have to find an alternative address to call. I have exactly the same problems when I enter a routine to accept a key press. Could you please explain why it is necessary to load the C register with a number (1 or 2) and explain what the CP/M operating system is and what alternatives there are? Also, could you give me an address to call that will give the desired effect and give me any other of the computer's own routines that may come in handy.

A It seems that the book you are using to learn machine code from is for a computer running under the CP/M system. CP/M is a series

of routines that load into the computer and can be used as a standard basis for program input/output. The problem is that the Spectrum, as it stands, does not run under CP/M but has its own operating system.

Starting with your first question, the CP/M BDOS (Basic Disk Operating System) has a whole series of commands that are accessed with Call 5. To differentiate between the various commands, the C register is loaded with the command number. When the computer performs Call 5 (under CP/M) the routine at location 5 checks the C register to see which command is to be executed. When sending information to the BDOS routines, any arguments such as a character to be output are transferred in the E register. Any routines which return values are then transferred in the accumulator. In general, for BDOS, command numbers go in C, parameters and arguments go in E (sometimes DE), and values are returned in A or HL. There are 36 routines in all, generally dealing with screen, keyboard, and discs. However, they are not available on the Spectrum and so will not be of much use. The above explains most of the second question as well.

Other operating systems, similar to CP/M, are MS-DOS/PC-DOS which runs on 8086 (N can be null, 1, 2, or 3) and 8088 machines, possibly UNIX which is mainly for 68000 machines (UNIX is slightly different), and GEM which runs on both. The similarity between all of these is that they contain a standard set of commands (individually since they are pretty well incompatible with each other) that are the same on whichever machine they are implemented on. They all control the input/output functions of the particular computer, and programs written for one machine with a particular operating system should run on another machine with the same system. The basic idea is one of standardisation, the only problem being that there are a number of standards.

The answer to the third question is perhaps the most important for you. The Spectrum has a built in control system in its Rom which controls all of the input/output, and also the Basic programming system. There are quite a few useful routines but,

unfortunately, I do not have time to detail them all. There are a number of books on the market that do reveal all, what you need is a Spectrum Rom disassembly book. Anyway, here are a few commands you can use from machine code.

Address	Comment
LD A,2	Open channel 2
CALL 1601	Assembly to access the screen
LD A,01	Enter as a ROM code (\$2010)
RET 16	RET or return to control to call back
RET	It is basically a software interrupt
RET	Just return to calling routine
4700	
LD A,0009	(\$0009 or \$000A) code
RET	code of the last register
00000	
CALL 2206	to examine the colour before the call
RET	
LD A,2	
CALL 1601	Open channel 2
CALL 0009	Open the screen
RET	ENDS

BBC shift

Mr Y Mayat, of Batley, West Yorks, writes:

Q I used to have a tape based system on my BBC Micro 32K. I do some programming in Assembly language and now, having upgraded to disc drive - an Opus Challenger - I am facing problems saving machine code onto disc.

An example I can give is a program from *Input* magazine - a graphics program in Mode 2 - which mentions that page=&3000 should be typed in and the machine code saved onto tape with *SAVE "NAME" D00 FD7. The program can then be loaded back in again when required and called with the instruction CALL &F5B. This procedure worked perfectly on tape but, as yet, I have not been able to make it work on disc even though I believe the object code is save on disc, the program does not work when called directly.

The manual on the disc drive mentions that to save machine code onto discs, the following should be done:

*SAVE <filename>
<start addr> <end

addr> <load addr> <execution addr>
or

*SAVE <filename>
<start addr> +
<length> <load addr>
<execution addr>

The load and execution addresses of the file are set to load address and execution address respectively, or to start address if not. These default addresses are used by *LOAD and *RUN.

A The first thing to note when the disc drive system has been installed on a BBC is that the normal value of Page has been altered. With cassette systems Page is £E00 but, when the DFS (Disc Filing System) is in, this moves up, usually to £1900 (Type P.PAGE to find out what Opus' DFS Page address is).

I'm not sure what your machine code routine does but it appears to be slap bang in the middle of some of the operating system workspace.

£D00-£D9E is the NMI routine (Non-Maskable Interrupt), £D9F-£DEF is the expanded vector set, and £DF0-£DF5 is the paged Rom workspace locations. All of these are probably used by the Opus DFS Rom.

Your problem is that either the routine is using the NMI for some reason although, in a cassette based machine, NMI is not used at all, or it is using space that is normally unused in page £D. Having installed a new DFS chip in your computer, sections of this page will be different and as NMIs are implemented, the program does not work.

There are two solutions, the hardest is to work out what the machine code does and move it somewhere else while allowing it to do the same thing or, slightly easier, load the machine code from disc into a different memory location, turn the disc off (*TAPE) and then move the code to its original location and call it.

For the first solution £900, £A00, £B00 or £C00 are usually good empty locations as long as you are not using sound for £900, tape for £A00, function keys for £B00, or defined characters for £C00. Since your program is from £D00 to £FD7 then moving it to £A00-£CD7 may well work. You will however have to re-assemble it with the new starting addresses.

The second solution is the easier of the two but has the drawback that once it is done, the disc system cannot be used. Use *LOAD to load the machine code into memory as, say, £2500 (where you actually put it depends on how big your other programs are) ie *LOAD NAME 2500 Then enter *TAPE to turn off the DFS, and move the code to £D00 with a for next loop ie FOR T%=0 TO £FD7-£D00:T%&D00=T%&£2500:NEXT then CALL £F5B to execute it. As you can see, this is not a very satisfactory measure, and the first solution is much better.

I'm not sure why Input asks you to enter PAGE=£3000 since, in mode two, this is the bottom of the screen. Hopefully the two suggestions above will help you get the code going.

Not fazed by phasor

P A Knight of Phasor Video, Elcot Lane, Marlborough, Wilts, writes:

Q With reference to your problem "The Sord Connection", PCW May 8-14, perhaps I can throw a little light on the subject, if you have not been inundated with thousands of solutions already!

The socket in question

is usually known as an EIAJ 8 pin (Associated Electrical Industries of Japan, I think), and has been knocking around for some 20 years or so. It is used as a bi-directional vision and audio monitoring port between industrial video tape recorders (Hi & Lo Band U-Matic, older Sony portables, and some VHS machines) and Japanese manufacturer's receiver/monitors. The VTR has a socket marked "TV" and the receiver/monitor one marked "VTR", strangely enough.

The connector is of a non-constant impedance nature, and thus is not recommended for 'real' video applications but is quite happy as a monitoring input/output. The equipment at either end expects to see a standard encoded vision signal i.e. 1V peak-peak (.3V sync/burst, .7V signal), and audio at ~10dB (200mV). However, most monitors will accept anything up to a volt or so of audio before distortion occurs.

The vision inputs terminate in 75Ω which may have to be removed internally in some computer applications - such as the case in question where the chap is tapping

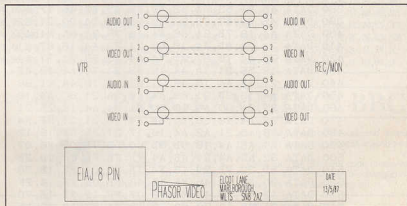
vision from the modulator which itself is terminated internally.

Quite often the monitor terminating resistor is mounted directly behind the socket and is thus very easy to remove. However, it could be mounted on the video board so a certain amount of cable tracing may be involved to find it. The resistor colour code will be purple, green, black, gold/pink.

Connecting cables are wired pin for pin between two plugs using multi-core comprising two audio screened cables and two 75Ω video cables. This means that the socket connections are wired "mirror imaged" (VTR out = mon in etc), but this should be of no matter in this case as you are only interested in the monitor end.

I have never encountered one of these connectors being used for RGB signals - usually it is BNCs, D, DINs Phonos, and SCARTs (ugh!) but you never know. I shall be interested to hear of the eventual outcome.

The plugs themselves can be obtained from the more usual component suppliers (RS part No. 470-730) at around a five-



Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem Peek it to Kenn Garroch and every week he will Poke back as many answers as he can. The address is Peek & Poke, PCW, 12-13 Little Newport Street, London WC2H 7PP.

er each. Any difficulties and Phasor can supply them.

A Thanks, sometimes I need all the help I can get.

Print Codes

Alastair Scott

This program allows you to send printer codes to any Amstrad or Epson compatible printer in a legible form. On running the program, 24 RSX com-

mands will be installed. The full set is shown on running.

For example, *iStrike* sets double strike mode on.

```

100 'Abbreviated Printer Codes
110 'by Alastair Scott
120 MODE 2:MEMORY &A2FF
130 FOR a=&A300 TO &A4AE
140 READ b$:POKE a,VAL("&" + b$):c=c+PEEK(a)
150 NEXT
160 IF c<>46493 THEN PRINT CHR$(7)"ERROR IN DATA!":END
170 CALL &A300:PRINT"New commands are..."
180 PRINT:PRINT":NLQx :BOLDx :WIDEx :MINIx :CONDx :PROPx
:ITALICx :UNDERx :SUBx
:SUPERx :STRIKEx";
190 PRINT:PRINT":RESET :FOREIGN,n"
200 PRINT:PRINT"with x=1 (on) or 0 (off) and n=0 to 7."
210 PRINT:END
220 DATA 01,09,A3,21,AF,A4,C3,D1,BC,53,A3,C3
230 DATA D6,A3,C3,DB,A3,C3,E0,A3,C3,E5,A3,C3
240 DATA EA,A3,C3,EF,A3,C3,F4,A3,C3,F9,A3,C3
250 DATA FE,A3,C3,03,A4,C3,08,A4,C3,0D,A4,C3
260 DATA 12,A4,C3,17,A4,C3,1C,A4,C3,21,A4,C3
270 DATA 26,A4,C3,2B,A4,C3,30,A4,C3,35,A4,C3
280 DATA 3A,A4,C3,3F,A4,C3,49,A4,C3,44,A4,4E
290 DATA 4C,51,B1,4E,4C,51,B0,42,4F,4C,44,B1
300 DATA 42,4F,4C,44,B0,57,49,44,45,B1,57,49
310 DATA 44,45,B0,4D,49,4E,49,B1,4D,49,4E,49
320 DATA B0,43,4F,4E,44,B1,43,4F,4E,44,B0,50
330 DATA 52,4F,50,B1,50,52,4F,50,B0,49,54,41
340 DATA 4C,49,43,B1,49,54,41,4C,49,43,B0,55
350 DATA 4E,44,45,52,B1,55,4E,44,45,52,B0,53
360 DATA 55,42,B1,53,55,42,B0,53,55,50,45,52
370 DATA B1,53,55,50,45,52,B0,53,54,52,49,4B
380 DATA 45,B1,53,54,52,49,4B,45,B0,46,4F,52
390 DATA 45,49,47,CE,52,45,53,45,D4,00,21,62
400 DATA A4,18,7B,21,66,A4,18,76,21,6A,A4,18
410 DATA 71,21,6D,A4,18,6C,21,70,A4,18,67,21
420 DATA 72,A4,18,62,21,74,A4,18,5D,21,77,A4
430 DATA 18,58,21,7A,A4,18,53,21,7C,A4,18,4E
440 DATA 21,7E,A4,18,49,21,82,A4,18,44,21,86
450 DATA A4,18,3F,21,89,A4,18,3A,21,8C,A4,18
460 DATA 35,21,90,A4,18,30,21,94,A4,18,2B,21
470 DATA 98,A4,18,26,21,9B,A4,18,21,21,9F,A4
480 DATA 18,1C,21,A2,A4,18,17,21,A5,A4,18,12
490 DATA 21,A8,A4,18,0D,3D,CO,DD,7E,00,E6,07
500 DATA 32,AD,A4,21,AB,A4,7E,FE,FF,C8,CD,2B
510 DATA BD,30,FB,23,18,F4,1B,78,01,FF,1B,78
520 DATA 00,FF,1B,45,FF,1B,46,FF,0E,FF,14,FF
530 DATA 1B,4D,FF,1B,50,FF,0F,FF,12,FF,1B,70
540 DATA 01,FF,1B,70,00,FF,1B,34,FF,1B,35,FF
550 DATA 1B,2D,01,FF,1B,2D,00,FF,1B,53,01,FF
560 DATA 1B,54,FF,1B,53,00,FF,1B,54,FF,1B,47
570 DATA FF,1B,48,FF,1B,40,FF,1B,52,07,FF,00

```

Xen 3

Simon T Goodwin

Here is the final part of Xen 3, which adds extra commands to Basic.
1464

This reclaims 2K of memory (ie, reverts to 464 memory format) by disabling the disc drive. This allows some pieces of incompatible software to be run (from tape).

:CHARSET
Switches to an alternate character set.

Note that it is not possible to return to the original format after this command has been used.

:PATCH
Patches printer output to the screen.
:NORMAL
Reverts printer output to normal.

```
1000 DATA A1,98,00,00,00,00,00,139
1010 DATA 00,52,53,58,20,45,52,206
1020 DATA 4F,52,2E,58,45,4E,20,46,220
1030 DATA 55,52,54,48,45,52,20,45,23F
1040 DATA 58,54,45,4E,53,49,4F,4E,278
1050 DATA 20,28,63,29,20,53,69,6D,210
1060 DATA 6F,6E,2E,54,2E,47,6F,6F,282
1070 DATA 64,77,69,6E,20,31,39,38,274
1080 DATA 37,20,3E,98,3C,62,98,3C,380
1090 DATA 98,98,3C,94,98,3C,80,98,52D
1100 DATA C3,D1,98,3C,6F,99,C3,C8,585
1110 DATA 99,C3,FC,99,C3,3C,9A,C3,54D
1120 DATA 58,9A,C3,75,9A,C3,81,9A,4A2
1130 DATA C3,9A,9A,C3,81,9A,43,52,49A
1140 DATA D4,46,4C,41,53,48,4F,CE,35F
1150 DATA 46,4C,41,53,48,4F,46,46,2C9
1160 DATA 46,49,4C,CC,54,57,4F,54,2F5
1170 DATA 4F,4E,C5,48,45,4C,00,4C,35/
1180 DATA 49,4E,45,53,43,52,4F,4C,25F
1190 DATA CC,43,48,41,52,53,45,04,356
1200 DATA 53,43,52,41,40,42,4C,C5,2C9
1210 DATA C5,4E,53,43,52,41,40,42,25B
1220 DATA 4C,4C,52,41,4E,48,53,57,2D7
1230 DATA 49,54,43,CB,34,36,84,50,316
1240 DATA 41,54,43,CB,4E,4F,52,40,2DC
1250 DATA 4C,CF,00,00,00,00,00,20C
1260 DATA 00,00,00,00,00,00,00,0
1270 DATA 00,00,00,00,00,00,00,0
1280 DATA 00,00,00,00,00,00,00,0
1290 DATA 38,44,82,82,FE,82,82,00,382
1300 DATA FC,82,82,8C,82,82,FC,00,4BC
1310 DATA 7C,82,80,80,80,82,7C,00,37C
1320 DATA F0,8B,84,84,84,8C,00,480
1330 DATA FE,80,80,FE,80,80,FE,00,4FA
1340 DATA 7E,80,80,FB,80,80,80,3F6
```

```
1350 DATA 7C,82,80,8E,82,82,7E,00,38E
1360 DATA 82,82,82,FE,82,82,82,00,40A
1370 DATA 7C,10,10,10,10,10,7C,00,148
1380 DATA 3E,08,08,08,88,88,70,00,106
1390 DATA 44,48,50,60,50,48,44,00,218
1400 DATA 40,40,40,40,40,40,7C,00,1FC
1410 DATA 82,C6,AA,92,82,82,82,00,40A
1420 DATA 82,C2,42,92,8A,86,82,00,40A
1430 DATA 38,44,82,82,82,44,38,00,27E
1440 DATA FC,82,82,82,FC,80,80,00,47E
1450 DATA 7C,82,82,82,9A,8C,76,00,39E
1460 DATA FC,82,82,FC,90,88,84,00,498
1470 DATA 7E,80,80,FC,02,02,FC,00,37A
1480 DATA FE,10,10,10,10,10,10,15E
1490 DATA 82,82,82,82,82,82,7C,00,388
1500 DATA 82,82,82,82,44,28,10,00,28A
1510 DATA 82,82,92,92,AA,44,44,00,35A
1520 DATA 82,44,28,10,28,44,82,00,1EC
1530 DATA 82,82,44,28,10,10,10,1A0
1540 DATA FE,04,08,10,20,40,FE,00,37E
1550 DATA 7C,86,8A,92,42,C2,7C,00,378
1560 DATA 20,60,20,20,20,20,FB,00,1FB
1570 DATA 7C,82,02,FC,80,82,FE,00,3FC
1580 DATA 7C,82,02,3C,02,82,7C,00,23C
1590 DATA 08,18,28,48,FC,08,08,00,19C
1600 DATA FE,82,80,7C,02,82,7C,00,37C
1610 DATA 7C,82,80,FC,82,82,7C,00,3FA
1620 DATA FE,82,02,04,08,10,20,00,18E
1630 DATA 7C,82,82,7C,82,82,7C,00,37C
1640 DATA 3C,42,42,3E,02,42,3C,00,17E
1650 DATA 00,00,F8,04,FC,84,76,00,2F2
1660 DATA 80,80,88,C4,84,C4,88,00,47C
1670 DATA 00,00,78,84,84,78,00,278
1680 DATA 04,04,74,8C,84,8C,74,00,28C
1690 DATA 00,00,7C,82,8C,80,7C,00,28E
```

```
1700 DATA 00,7C,80,80,FB,80,80,00,374
1710 DATA 00,00,7C,82,82,7E,02,FC,2FC
1720 DATA 80,80,88,C4,84,84,00,408
1730 DATA 00,10,00,30,10,10,38,00,98
1740 DATA 04,00,04,04,44,44,38,00,CC
1750 DATA 00,88,90,AA,00,AA,98,00,380
1760 DATA 60,20,20,20,20,20,70,00,170
1770 DATA 00,00,6C,92,92,92,92,00,284
1780 DATA 00,00,68,64,44,44,44,00,188
1790 DATA 00,00,7C,82,82,82,7C,00,27E
1800 DATA 00,00,FB,84,84,FB,80,00,3FB
1810 DATA 00,00,7A,84,84,7C,04,0E,208
1820 DATA 00,00,58,64,40,40,40,00,17C
1830 DATA 00,00,7E,80,FC,02,FC,00,2F8
1840 DATA 00,20,38,20,20,28,10,00,00
1850 DATA 00,00,84,84,84,84,7C,00,28C
1860 DATA 00,00,44,44,44,28,10,00,104
1870 DATA 00,00,82,92,92,AA,44,00,294
1880 DATA 00,00,88,50,20,50,88,00,100
1890 DATA 00,00,44,44,44,3C,04,78,184
1900 DATA 00,00,7C,08,10,20,7C,00,130
1910 DATA 48,61,63,68,69,6E,6F,20,205
1920 DATA 73,74,72,69,63,74,6C,79,37E
1930 DATA 20,72,6F,68,69,62,69,300
1940 DATA 74,65,64,2E,2E,2F,79,282
1950 DATA 20,6F,72,64,65,72,20,48,204
1960 DATA 40,20,6F,6F,76,65,72,6E,2FE
1970 DATA 60,65,6E,74,2E,40,6F,6E,306
1980 DATA 69,73,74,72,79,20,6F,66,330
1990 DATA 20,53,69,6C,6C,79,20,57,204
2000 DATA 61,6C,68,73,2E,57,68,69,301
2010 DATA 74,65,68,61,6C,6C,20,53,2ED
2020 DATA 57,31,2E,2E,2E,2E,28,63,1CB
2030 DATA 29,20,53,54,47,20,31,39,1C1
2040 DATA 38,37,00,00,00,00,00,6F
```

Memzap Utility

Iain Tatch

Memzap is a fast, real time machine code memory dump utility. When run, it displays memory in a format similar to "Dump. This is updated continuously by the program at a speed of

about 15 screen refreshes a second, as can be seen by examining an area around zero page.

Once run, the machine code is assembled at 87000 but this can be changed by altering P% in the Basic program.

```
10FORT=0T02STEP2
20PZ=47000
30DPTT
40LDA#22:JSR#FEE:LDA#7:JSR#FEE
45LDA#10:STA#E00:LDA#32:STA#E01
50,go LDA#0:STA#70:LDA#7C:STA#71
60LDX#24:bigloop
```

```
70LDA#73:JSR#hex:LDA#72
80JSR#hex:P:LDA#32:JSR#rmt
90LDY#0:loopa
100LDA:1002,Y:JSR#hex:P
110INY:CPY#8:BNE100a
120LDA#32:JSR#rmt:LDY#0:loopb
130LDA#72,Y:BPL00a
```

```
140SEC:SBC#128:.overa
150CHP#127:BNEoverb
160LDA#ASC".":overb CHP#32:BPLoverc
170LDA#ASC".":.overc
180JSR#rmt:INY:CPY#8:BNE100b
190LDA#32:JSR#rmt
```

continued on page 22 ►

PROGRAMMING: BBC

PROGRAMMING: BBC

```
200LDA#72:CLC:ADC#8:STA#72
210LDA#73:ADC#0:STA#73
215DEX:BNB:goto loop
220LDA#129:LDY#255:LDX#8
230JSR#FFF4:CPX#FF:BNENo
240CPY#FF:BNENo
250LDA#72:CLC:ADC#8:STA#72
260LDA#73:ADC#0:STA#73
262LDA#129:LDY#255:LDX#FF
264JSR#FFF4:CPX#FF:BNENo
266CPY#FF:BNENo
268LDA#72:CLC:ADC#176:STA#72
269LDA#73:ADC#0:STA#73
270JMP cont: no
280LDA#129:LDY#255:LDX#8
290JSR#FFF4:CPX#FF:BNENo
```

```
300CPY#FF:BNENo
310LDA#72:SEC:SBC#8:STA#72
320LDA#73:SBC#0:STA#73
322LDA#129:LDY#255:LDX#FF
324JSR#FFF4:CPX#FF:BNENo
326CPY#FF:BNENo
328LDA#72:SEC:SBC#176:STA#72
329LDA#73:SBC#0:STA#73
330, cont
340LDA#129:LDY#255:LDX#8
350JSR#FFF4:CPX#FF:BNENx
360CPY#FF:BNENx
370LDA#31:JSR#FEE
380LDA#0:JSR#FEE:LDA#24:JSR#FEE
390BRK: EQU#27: EQU# "Escape": BRK
890, nxt
```

```
900LDA#72:SEC:SBC#192:STA#72
910LDA#73:SBC#0:STA#73
920JMP go
1000, print $10/75:Ltr#0
1010$TA(70),Y:LDA#70:CLC
1020ADC#1:STA#70:LDA#71
1030ADC#0:STA#71:LDY#75:RTS
1040, hexsp JSRhex:LDA#32:JMP print
1050, hex PHA:AND#F0
1060LDA#1:LSR:LDA#5:JSRhex
1070FLA:AND#F
1080, chex
1090CPY#10:BFLaiph
1100CLC:ADC#48:JMP print
1110, alph CLC:ADC#55:JMP print
10000:NEXT
```

PROGRAMMING: MEMOTECH

Recovery

A F Wilson

Recovery is a utility for the Memotech MTX series of micros which mimics the BBC micro command *Old*. Recovery, as its name suggests, recovers programs which have been accidentally erased. The utility is interrupt driven, thus the program is available at all times. Function key *F1* is used to save the system variables and *F2* to restore the saved system variables.

As you will soon see, the recovery listing is for the disc-based system, but by removing the *USER* command from line 120 of listing this allows the program to work on a tape-based MTX micro. Note MTX 500

owners should change all £4000 references to the equivalent £8000 addresses. The program, when loaded, auto runs itself, and relocates itself in high memory, then sets the interrupt vector and *NEW*'s itself. The program won't affect any Basic programs and is available at all times, just press *F1* and *F2*.

To save the program, type *GOTO 120*. This will save the program. When you come back to reload the program, the Basic OS is ready to execute line 140. The *RUN* command sets the Basic OS to line 10, which goes to line 100. The code at line 100 then moves the relocatable code in line 20, to the top of free space, sets the interrupt vector to point to the relocated code. Once this is done the program *NEW*'s itself, as we don't need the basic listing - just the code at *£BF34*.

To use the program, load it using *USER LOAD "RECOVERY.BAS"* for disc users, or

LOAD "" for tape users. Type in the following example.

```
10 PRINT "TEST"
20 REM
```

Now press *F1* to save the current program. Type in *PANEL <RET> D BF97 <BRK>*. The hex dump at the bottom of the screen displays the contents of *FIRSTBB.SYSVARS*. These should be:

```
0C 00 0A 00 90 22 54 45 12 40 00 40 12 40
12 00 00 40 12 40 00
```

Type *NEW <RET>*, then press *F2* to recover.

However, if you press the *RESET* keys then you lose the interrupt code. This means you cannot use the function keys. At this stage you can either save the program you are working on and reload the *Recover* program or use the following two commands to save and restore.

```
To save : RAND USR(48960)
To recover : RAND USR(49012)
```

Listing 1

```
10 GOTO 100
20 CODE
4010 LD A,(F0FD) :LET A=THE LAST ASCII KEY PRESSED.
4013 CP £80 :IS IT 'F1'
4015 JR 1,SAVEPRG :IF SO GOTO SAVE VARIABLES
4017 CP £B1 :IS IT 'F2'
4019 JR 2,RESTPRG :IF SO GOTO RESTORE VARIABLES
401B RET :RETURN TO CALL ROUTINE
401C SAVEPRGHL HL,£4000 :POINT HL TO START OF BASIC
401F LD B,£BF97 :SAVE AT FIRSTBB
4022 LD B,C :18 BYTES TO SAVE
4025 LDIF :SAVE THE 9 BYTE BLOCK
4027 SLOOPLOD LD,£BF9F :POINT DE TO SYSVARS
402A LD 1,X,£BF90 :POINT 1X TO 1ST OF SYSTEM VARS.
402C LD B,7 :256 WORDS TO SAVE.
4030 SYSVLOD LD A,(£FAD) :LET A=SAVE OR RESTORE FLAG.
4032 LD HL,£FA :11MB OF SYSTEM VARIABLE
4035 LD L,(11X) :21MB OF SYSTEM VARIABLE
4038 PUSH DE :SAVE DE AS AFFECTED ON RESTORE
4039 CP 0 :IS FLAG=0?
403B JR 2,SAVE :IF SO SAVE SYSTEM VARIABLES
403D CALL,£BF97 :RESTORE SYSTEM VARIABLES
403F JR,LOADS :ONCE RESTORED WORD BYPASS SAVE.
4042 SAVE1 :CALL,£BF9B :SAVES SYSTEM VARIABLES
4045 LOADS1 :POP DE :RESTORE CORRUPTED REGISTER PAIR
```

```
4046 INC DE :IMOVE DE ONTO 2 PLACES
4047 INC DE :
4048 INC 1X :IMOVE 1X TO NEXT WORD IN VARSISP
4049 SINZ SYSVLOD :ITS ALL FINISHED
404C LD,£FAD) :A :RESET FLAG
404E RET :RETURN TO CALLING ROUTINE
404F RESTPRGHL HL,£BF97 :RESTORE FIRSTBB AT £4000 ON A MTX
4050 LD DE,£4000 :252 COMPUTER,£8000 ON A MTX 500.
4052 INC DE :18 BYTES TO BE RECOVERED
4053 LDIR :MOVE THEN BACK.
4055 LD A,1 :SET FLAG FOR RESTORE
4056 LD (£FAD),A :IMOVE IT IN FLAG
4058 JP,£BF4B :GOTO SLOOPLOD
4059 RESSVISV DE,HL :LET DE=HL 5 HL=DE, FOR RESTORING.
4064 SAVSYSVLD A,HL :SAVE CONTENTS OF DE AND HL.
4065 LD (DE),A :
4066 INC HL :
4067 INC DE :
4068 LD A,(HL) :
4069 LD (DE),A :
406A XOR A :
406B RET :CLEAR REGISTER A AND FLAG
406C VAPDISP LD,£A,£A7,£A8,£A9,£AC,£C,£C,£C :
4072 FIRSTBBR 8 :RETURN TO MAIN PART
407B SYSVAR: DE 14 :
408B FLAG: DE 0 :
409A RET
```

100 CODE

```
420C LD HL,$4010 ;MOVE THE CODE IN LINE 20 TO
420F LD HL,$F34 ;TOP OF FREE SPACE.
4212 LD BC,120 ;JUST BELOW THE BASIC VARIABLE
4215 LDIR ;RAM AT $C000 TO $DFFF.
4217 LD A,$C3 ;LET INTERRUPT VECTOR TO JP $F34
4219 LD ($F34),A ;THE JP $F34 IS STORED IN A
421C LD HL,$F34 ;RESERVED 3 BYTE SPACE AT $F34.
421F LD ($F34),HL ;THIS IS CALLED EVERY 64TH OF A
```

```
4222 LD A,($F34) ;SECOND WHEN INTFF, ADDRESS IS
4225 OR $F ;SET BY SETTING BITS 4 AND 7, SEE
4227 LD ($F34),A ;BASIC REFERENCE MANUAL.
422A RET ;RETURN TO BASIC
```

```
110 NEW
120 USER SAVE "RECOVERY.BAS" ;FOR FOR DISC USERS
130 REM USE SAVE "RECOVERY" FOR TAPE USERS.
140 RUN
```

PROGRAMMING: COMMODORE 64

Micromon

P A Fairclough

Here's part three of Micromon, the multi-function machine code programming utility.

M - Memory.

Format : M addr or
M addr, addr

Memory will convert memory into hexadecimal bytes. Any value may be changed by overtyping the original and pressing Return.

"Micromon is a multi-function machine code programming utility for the Commodore 64"

N - Number.

Format : N addr,addr,offset,addr,addr or
N addr,addr,offset,addr,addr,W

Number allows all absolute addresses in a machine code program to be changed. If W is specified then the code is assumed to be a word table consisting of an iteration of addresses in low byte/high byte format.

The first two addresses specify the block code to be numbered. The last two addresses specify the old block of the code. Offset is a hexadecimal value indicating how much is to be added to each absolute address to make the addressing correct.

O - Out.

Format : O value or
O value,value

Out will tell the monitor how the Roms are set before memory access. The command may consist of one or two hexadecimal values.

The first data value used is to show how the memory is set up before access. Only the first 3 bits are used and have the same function as location \$01. The images seen are:

Value	I/O	Kernal	Basic
	(\$D000)	(\$E000)	(\$A000)
00	Ram	Ram	Ram
01	I/O	Ram	Ram
02	Chr	Ram	Ram
03	Chr	Ram	Ram
04	Ram	Ram	Ram
05	I/O	Ram	Ram
06	I/O	Ram	Ram
07	I/O	Ram	Ram

I/O are the VIC, SID and CIA chips. Chr is the Character Rom.

The second value is used by the G, Q and W commands to show how the Basic Rom (at \$A000) is always set. Only the first bit is used. The first value has priority over this one. The byte has the following function:

Value	Basic
	(\$A000)
00	Ram
01	Ram

P - Print.

Format : P value data

Print allows the user to send data bytes to the printer. The printer must have been opened by using the relevant function key.

The value tells the monitor what Ascii code to send along with a carriage return. Data may consist of one or more hexadecimal bytes.

Q - Quick.

Format : Q or Q addr

Quick runs a machine code program

starting at the PC or the address. Each instruction is checked to see if a breakpoint should occur. Pressing the Stop key will display the registers. Program execution will be passed to the W command if a breakpoint occurs.

R - Registers.

Format : R

Registers will display the current register values of the 64. They are:

PC - Program Counter
SR - Status Register
N - Negative Sign Bit
V - Overflow Bit
-- - Unused Bit
B - Break Bit
D - Decimal Bit
I - Interrupt Bit
Z - Zero Bit
C - Carry Bit

AC - Accumulator
XR - X Register
YR - Y Register
SP - Stack Pointer

Any of the values may be changed by typing over the old value and pressing Return.

S - Save.

Format : S "filename",device,addr,addr
;sec or
S @addr,device,addr,addr,sec

Save will store a block of memory as a file on a device.

The filename must be enclosed in quotation marks. If the filename supplied is an '@' sign with an address then the filename will be taken from the 187 bytes commencing at the address.

The device must be 01 for cassette, or 08 for diskette. The secondary address must be 00 for a relocatable file, or 01 for an unrelatable file.

PROGRAMMING: C64

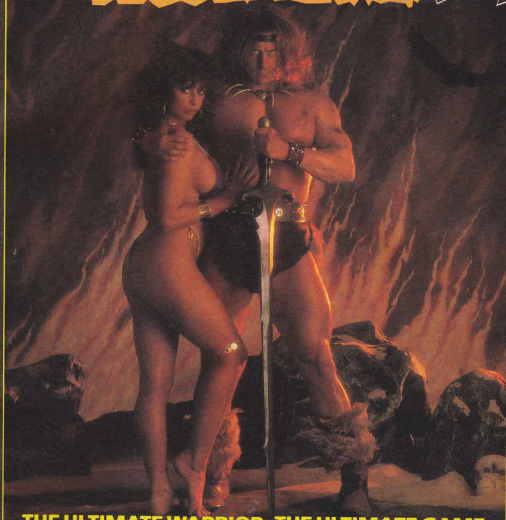
```

10227 DATADC,C9,7F,D0,2C,A2,53,4C,1121
10228 DATA82,C0,A9,40,D0,06,A9,80,1066
10229 DATAD0,02,A9,00,85,15,A9,00,702
10230 DATA85,FB,A4,11,84,43,A4,12,946
10231 DATA84,44,20,1D,C6,F0,07,20,738
10232 DATAC6,C8,85,02,86,03,20,E2,928
10233 DATAC0,A5,1A,F0,20,A5,0F,C5,1032
10234 DATA02,D0,13,A5,10,C5,03,D0,818
10235 DATA0D,A5,15,D0,14,20,73,CC,778
10236 DATAA9,C0,85,14,D0,0B,A5,15,919
10237 DATAD0,07,20,6F,CC,A5,15,F0,988
10238 DATA0C,AD,ED,CF,8D,19,03,AD,971
10239 DATAEC,CF,8D,18,03,78,A6,08,905
10240 DATA9A,A5,03,48,A5,02,48,A5,798
10241 DATA04,48,A5,05,48,A6,06,A4,654
10242 DATA07,20,F0,C9,A5,15,05,14,691
10243 DATAF0,17,A9,FF,8D,0D,DD,A9,1231
10244 DATA07,8D,04,DD,A9,00,8D,05,688
10245 DATADD,AD,0D,DD,A9,0B,8D,0E,963
10246 DATADD,68,40,20,63,C8,85,45,922
10247 DATA86,46,20,C3,C8,85,22,86,932
10248 DATA23,20,C3,C8,85,AE,86,AF,1078
10249 DATAA0,00,20,1D,C6,F0,08,20,699
10250 DATACF,FF,C9,57,D0,01,C8,84,1291
10251 DATA1D,20,B3,C8,A6,28,D0,18,878
10252 DATA20,85,C1,90,13,A4,1D,D0,922
10253 DATA18,20,66,CC,20,B7,C3,AA,942
10254 DATA8D,C1,CE,D0,06,20,11,C3,1046
10255 DATA4C,97,C0,A4,20,C0,02,D0,1017
10256 DATA39,84,20,88,38,20,66,CC,751
10257 DATAAA,E5,22,C8,20,66,CC,E5,1200
10258 DATA23,90,27,88,20,66,CC,85,825
10259 DATA16,A5,AE,E5,16,C8,20,66,946
10260 DATACC,85,16,A5,AF,E5,16,90,1094
10261 DATA11,88,18,8A,65,45,20,7A,639
10262 DATACC,C8,20,66,CC,65,46,20,945
10263 DATA7A,CC,20,2F,C9,88,10,FA,1008
10264 DATA30,9A,20,D7,C8,29,07,85,830
10265 DATAF8,20,D4,C8,29,01,09,06,749
10266 DATA85,F9,4C,97,C0,20,D7,C8,1248
10267 DATA85,42,20,D4,C8,20,F0,C0,1107
10268 DATA4C,5A,C8,20,80,C8,20,C3,953
10269 DATAC8,85,25,86,26,20,15,C6,793
10270 DATA20,C6,C8,85,C1,86,C2,60,1180
10271 DATA20,C6,C8,80,06,20,70,C8,956
10272 DATA20,C3,C8,85,C3,86,C4,60,1181
10273 DATA20,DB,C0,A5,C2,20,92,C8,1180
10274 DATAA5,C1,48,A4,4A,4A,20,758
10275 DATAAA,C8,AA,68,29,0F,20,AA,902
10276 DATAC8,48,8A,20,E4,C0,68,4C,1042
10277 DATAEA,C0,C9,0A,90,02,69,06,888
10278 DATA69,30,60,A2,01,B5,C1,48,858
10279 DATAB5,C3,95,C1,68,95,C3,CA,1368
10280 DATA10,F3,60,20,15,C6,20,D7,853
10281 DATAC8,90,06,A0,20,D7,C8,B0,1143
10282 DATAF1,4C,92,C0,20,15,C6,20,938
10283 DATA15,C6,F0,FB,20,3B,CC,0A,1015
10284 DATA0A,0A,0A,85,2A,20,15,C6,456
10285 DATA20,3B,CC,05,2A,38,60,20,526
10286 DATAE2,C0,A9,3A,20,88,C8,A9,1182
10287 DATA08,A8,20,DE,C0,20,48,CC,930
10288 DATA20,92,C8,20,2F,C9,88,D0,1002
10289 DATAF1,60,A2,03,4C,7D,C3,20,930
10290 DATAD7,C8,90,0A,A2,00,20,08,771
10291 DATAC2,20,4E,C1,D0,B3,20,2F,963
10292 DATAC9,C6,1E,60,A9,05,85,C1,1025
10293 DATAA9,00,85,C2,A9,04,60,E6,995
10294 DATAC1,D0,06,E6,C2,D0,02,E6,1271
10295 DATA28,A6,28,60,A5,1A,F0,0A,783
10296 DATA20,73,CC,98,85,1A,85,0F,810
10297 DATA85,10,4C,97,C0,A2,04,20,766
10298 DATA66,C1,A9,3B,20,DB,C0,A5,1131
10299 DATA03,20,92,C8,A5,02,20,92,726
10300 DATAC8,20,6D,C9,20,24,C9,20,843
10301 DATAF9,C8,4C,97,C0,20,DE,C0,1314
10302 DATAA5,04,85,21,A0,07,26,21,573
10303 DATAA2,30,90,01,E8,8A,20,E4,985
10304 DATAC0,88,10,F2,60,20,C3,C8,1109
10305 DATA85,02,86,03,20,9E,C9,20,695
10306 DATA24,C9,85,1E,20,15,C6,20,683
10307 DATA0F,C9,D0,F8,F0,CC,20,15,1169
10308 DATAC6,20,15,C6,20,AA,C9,85,985
10309 DATA04,60,A0,07,84,1E,D0,03,640
10310 DATA20,15,C6,29,01,18,26,27,394
10311 DATA05,27,85,27,C6,1E,10,F0,700
10312 DATA06,78,A2,F8,9A,A9,37,85,1137
10313 DATA01,20,F0,C9,6C,02,A0,AD,917
10314 DATA14,03,AE,15,03,CD,EA,CF,867
10315 DATAD0,05,EC,EB,CF,F0,10,85,1280
10316 DATA0B,86,0C,AD,EA,CF,AE,EB,1180
10317 DATACF,8D,14,03,8E,15,03,60,633
10318 DATAA5,0B,8D,14,03,A5,0C,8D,658
10319 DATA15,03,60,AD,F1,CF,48,AD,986
10320 DATAF0,CF,48,A9,00,48,48,904
10321 DATA48,6C,0B,00,A0,00,20,2F,430
10322 DATACC,C9,3A,F0,06,C9,2C,F0,1194
10323 DATA02,C9,27,60,A5,39,D0,30,816
10324 DATAE6,39,AD,8D,02,C9,06,D0,1018
10325 DATA13,A0,50,CA,D0,FD,88,D0,1266
10326 DATAFA,20,02,CC,AD,88,02,E9,1032
10327 DATA03,20,9C,CA,A5,C6,F0,0E,1010
10328 DATAAD,8D,02,AA,29,02,F0,03,772
10329 DATA20,56,CA,20,CF,CA,C6,39,1016
10330 DATA68,A8,68,AA,68,40,AD,77,1006
10331 DATA02,C9,89,D0,13,A9,0D,20,781
10332 DATAF0,C0,A9,04,20,C3,FF,A9,1256
10333 DATA03,20,C9,FF,A9,00,85,FB,1044
10334 DATAC9,8A,D0,13,A9,00,8D,BD,1065
10335 DATAFF,A9,04,AA,20,BA,FF,20,1103
10336 DATAC0,FF,A2,04,20,C9,FF,C9,1302
10337 DATA8B,D0,04,A9,80,85,FB,C9,1233
10338 DATA8C,D0,3B,20,02,CC,AD,88,954
10339 DATA02,18,69,04,8D,88,02,29,455
10340 DATA3C,0A,0A,85,1E,AD,18,D0,648
10341 DATA29,0F,05,1E,8D,18,D0,A5,629
10342 DATAD2,29,03,0D,88,02,85,D2,748
10343 DATAAD,88,02,49,C0,29,C0,AD,819
10344 DATA2A,2A,85,1E,AD,00,DD,29,682
10345 DATAFC,05,1E,8D,00,DD,60,A6,911
10346 DATAD1,86,C1,A6,D2,86,C2,A2,1402

```


B A R B A R I A N

The Ultimate Warrior



THE ULTIMATE WARRIOR THE ULTIMATE GAME



COMMODORE VERSION

Available from all good computer game stockists,
or by mail order from: Palace Software,
275 Pentonville Road, London N1 9NL.

AVAILABLE FOR:
COMMODORE 64
48k SPECTRUM
AMSTRAD CPC



PALACE SOFTWARE



AMSTRAD VERSION

Send cheque or postal order for £9.99 (Cassette),
or £12.99 (Commodore or Amstrad Disk) plus 80p P&H.
Access and Barclaycard holders telephone 01-278 0751.

Shake

Robin Davies

The following routine for the Commodore 64 will move the characters around to give the effect of an earthquake or explosion, causing the screen to shake.

```
10 REM SCREEN SHAKE EFFECT
11 REM
12 FORA=1TO10:POKE53265,23
13 FORB=1TO10:NEXTB
14 POKE53265,27:NEXTA:GOTO16
15 READY.
```

Rattle

Paul Hutchison

This Amstrad CPC routine will invert the entire screen. It works in any mode but the following Pokes must be carried out on location &AB07 when the mode is changed.

Poke &AB07,&FF (mode 0)
Poke &AB07,&FO (mode 1)
Poke &AB07,&CO (mode 2)
Use Call &AB00 to use.

```
10 MEMORY &AAFF
20 A=43776
30 READ B$:IF B$="-1" THEN END
40 POKE A,VAL("&"+B$)
50 A=A+1
60 GOTO 30
70 DATA 21,00,00,01,00,40,16,FF,7E,AA,77,23,0B,78,B1,C2
80 DATA 06,AB,C9,-1
```

Roll Clear

Paul Hutchison

The last of our screen utilities is for the Amstrad CPC again, and clears the screen in an interesting fashion. The effect is obtained by rotating each location eight times and gives the impression of each character gradually rotating off the screen.

To use enter, Call &AB00.

```
10 MEMORY &AAFF
20 A=43776
30 READ B$:IF B$="-1" THEN END
40 POKE A,VAL("&"+B$)
50 A=A+1
60 GOTO 30
70 DATA 16,0B,21,00,C0,01,00,40
80 DATA 7E,17,77,23,0B,78,B1,C2
90 DATA 0B,AB,15,C2,02,AB,C9,-1
```

We want your programs!!

Yes, this is your chance to get rich and famous. Well, famous anyway, as *Popular Computing Weekly* is looking for contributions to the Programming pages.

What sort of thing are we looking for? You name it - anything original from games to utilities, applications and the like, written in Basic, machine code or anything else you can think of.

Programs for any computer will be considered, not just the old

faithfuls (Spectrum, Amstrad, QL, Commodore, etc), so send those listings in. What we need is a working copy of the program on tape or disc, plus an accompanying article or documentation that you would anticipate going with the piece, normally not over 2000 words.

Alternatively, send in your short programs to the Bytes and Pieces page - what could be easier?

In return, we'll pay the princely sum of £25/page for the main

each Bytes & Pieces contribution we publish. Plus the fact that your name will be indelibly carved in the *Popular Programming Hall of Fame* till time immemorial. What more could any true programmer ask?

Just send your masterpieces in to **Duncan Evans, Technical Editor, Popular Computing Weekly, 12-13 Little Newport St, London WC2 7PP** and he'll assess them post haste.

C: the final chapter

Kenn Garroch winds up his series on programming in C, and we bring you some special offers to get you started on your own C programs

For all that C is able to access the lower levels of a machine, with inline, and pointers, it also has features that put it well into the high level language class.

Data structuring is one of these features. A data structure is a way of blocking together different types of information under one name. For example, a structure named 'person' could have the subsections: 'name', 'age', and 'address'. These are of different data types, addresses usually consisting of arrays of characters, and ages of single numbers.

C sets up what is known as a template for a structure with the *struct* command. The template is a design for the structure which doesn't set aside any memory space until it is actually used. Taking the above example:

```
struct person {
  char name[15];
  int age;
  char address[40];
};
```

sets up the template for a person structure. To actually start using this, the structure must be given a name, eg,

```
struct person someone {"Jane", 25, "28 long lane"};
```

defines the structure 'someone' and places some data into it. A minor note here is that some versions of C do not allow this pre-filling of the structure. However, this doesn't usually matter since any information to be put in can do so during the course of the program.

Inside a structure

Once a data structure has been defined, the separate portions of it need to be accessed. For instance, the name of someone may be needed. To get at the insides of a structure, either the *.* operator, or a pointer can be used.

The simplest of these two is the dot which is placed between the structure name, and one of its internal section names. With the above example, *someone.age* gives the contents of the age portion.

When accessing strings within structures, the same rules as with all other strings apply, ie, the name is a pointer to

the first item in the array, and not the item itself. The same thing applies to structure names, the name is a pointer to the location in memory where the structure is stored.

A single structure is usually of limited use, and the ability to have arrays of them makes them much handier. Following the definition of the structure, an array can be set up in a similar way to other arrays, eg,

```
struct person people[10];
```

This defines an array of ten structures of the type person which has been set up previously. Accessing each individual's details can now be performed with, for example, *people[1].name*, which gives a pointer to the first character in the name of individual 1 in the people array.

Using pointers

It is also possible to use pointers to structures with the *->* operator. Set up a structure:

```
room {
  char exits[6];
  char desc[100];
  int connect[6];
};
```

which could be used in an adventure game to describe a room. Set up one room with:

```
struct room entrance;
// and a pointer to entrance with:
struct room *p=&entrance;
```

The *&* operator gives the start address in memory of where the structure is stored. For example, after the above, try:

```
main()
{
  p->exits[0]='U';
  printf("First char is %c at memory location %x", *p, p);
}
```

which proves the point and also shows the order in which the structure is set out in memory, ie, the same as the template.

If there were an array of rooms (makes sense in an adventure), then the pointer should be set up to point to a particular

room, eg, *struct room *P=&entrance[0]* sets up *p* to look at the first in the array.

To look at the next room in the array, simply increase the pointer by one which moves to the next structure entry in the array.

The incrementing of the pointer shows an important detail about pointers - they are typed. Incrementing the pointer by one moves it to the next structure in the array, not the next memory location.

Complex information

Structures can also have other structures within them allowing quite complex information to be stored and manipulated in a simple and logical fashion. The overleaf program demonstrates a number of features of C including the use of structures. It sets up a simple adventure program system with room descriptions and connections followed by a playing routine.

As it stands, it is simply a demonstration. However, it can easily be expanded to create a complete stand alone adventure design and playing program.

GOTO label

Looking back over the past few articles, I have noticed a few inaccuracies have crept in. Firstly, it is possible to jump around a program in Basic fashion with GOTO label where label has been previously set up, ie:

```
/* this goes on forever */
main()
{
  here:
  printf("Stop me please!\n");
  goto here;
}
```

GOTO cannot be used to jump from within one function to another but it can sometimes (rarely, if possible) be useful.

Secondly, it seems that there was a misprint stating that the *'\'* is used to precede formal characters of course, this should have been *'\n'* as in *\n* for a new line.

continued on page 28 ►

PROGRAMMING FEATURE

◀ continued from page 27

I also noticed that in the inline poke command, the address was said to be back to front for a Z80, ie, lo-hi. Actually this is taken care of and the poke command is:

```
#define ldlhi 0x2A
#define ldl 0x3A
#define sta 0x77
poke(addr,n)

static unsigned loc;
static char val;
loc=addr;
val=n;
inline(lda, &val, ldlhi, &loc, sta, &val);
```

and just for completeness this is peek (note definitions are different):

```
#define ldlhi 0x2A
```

“Structures can also have other structures within them allowing quite complex information to be stored and manipulated in a simple and logical fashion”

```
#define ldl 0x7E
#define sta 0x32
peek(addr)

static unsigned loc;
static char val;
loc=addr;
inline(ldhi, &loc, ldl, sta, &val);
return val;
```

Lastly, a C program is not a program but a collection of one or more functions - which is technically quite true. I am, unfortunately, corrupted from having used too many different programming languages. I tend to refer to the products of them all as 'programs'.

My thanks to Mr Lavelle (and any others who have written in) for his kindness on pointing these facts out.

```
struct room {
    char exits[6];
    char descr[100];
    int connect[6];
};

struct room adv[10];

main()
{
    int e,move,maxrm,r,t;
    char dir;
    r=1;
    printf("How many rooms ?\n");
    maxrm=gnum();
    for (r=0 ; r<(maxrm ; r++)
    {
        printf("Enter the description for room
%d\n",r);
        gtext(adv[r].descr);
        printf("Room number %d has description
%e\n",r,adv[r].descr);
        printf("Enter exits Up Down North East
West South \n(initial letter only eg UD
is Up and Down): \n");
        gtext(adv[r].exits);
        t=0;
        while (adv[r].exits[t] != 0)
        {
            printf("Enter connecting room %c \n"
,adv[r].exits[t]);
            adv[r].connect[t++]=gnum();
        }
        for (r=0 ; r<(maxrm ; r++)
        {
            printf("Room %D has description %s
and exits \n",r,adv[r].descr);
            t=0;
            while (adv[r].exits[t] != 0)
            printf("%c leading to %d\n",
adv[r].exits[t],adv[r].connect[t++]);
        }
        /* play from here */
        r=0;
        e=0;
        while (e == 0)
        {
            doroom(adv[r].descr,adv[r].exits);
            move=0;
            while (move==0)
            {
```

```
                dir=gdir();
                if (dir=='Q') (e=1; move=1);
                t=0;
                while ((dir != adv[r].exits[t])
&& (adv[r].exits[t] != 0))
                    t++;
                if (adv[r].exits[t]==0)
                    printf("You cannot go that
way\n");
                else move=1;
            }
            r=adv[r].connect[t];
        }
    }

gtext(pnt)
char *pnt;
{
    char c;
    int t;
    while ((c=getchar()) != '\n')
        *pnt++;
    *pnt=0;
}

gnum()
{
    char s[5];
    int c,t,tot;
    t=0;
    tot=0;
    while((c=getchar()) != '\n')
        s[t++]=c;
    for (c=0; c<t; ++c)
        tot=tot*10+s[c]-'0';
    return tot;
}

doroom(pnt0,pnt1)
{
    printf("You are in %s available
exits are: %s.\n",pnt0,pnt1);
    printf("Which way do you want
to go?\n");
}

gdir()
{
    char c,d;
    while((c=getchar()) != '\n')
        d=c;
    return d;
}
```


Pick up a bargain C compiler

If your appetite for C has been whetted by our series and you're thinking of rushing out to buy a compiler, why not take advantage of one of these exclusive special offers?

Popular Computing Weekly has got together with a number of companies to come up with a wide range of specially priced C packages, covering most popular machines. Here are the goodies:

Popular C offers

(All prices include VAT, postage and packing)

Spectrum

HiSoft C - specially packaged with Adam Denning's book **C at a Glance**: £25

Commodore 64 and 128

Abacus Software's **Super C** from Precision: £40.95 (10% discount)

Amstrad CPCs

HiSoft C on tape - packaged with **C at a Glance**: £19.95

HiSoft C on disc - with **C at a Glance**: £34.95 (£5 off)

Atari ST

Lattice C - the brand new version 3.04 - from Metacomco: £90 (10% discount)

Commodore Amiga

Lattice C - version 3.1 from Metacomco: £170 (normally £189.95)

Sinclair QL

Lattice C - from Metacomco: £90 (10% discount)

CP/M (runs with MSX machines)

HiSoft C on disc - with **C at a Glance**: £34.95 (£5 off)

CP/M 2.2 (suitable for Amstrad 6128 and 8256/8512)

Analytical Engines' **MIX C**: £54.95

Aztec C Prime and HiSoft GSX graphics (one package): £89.95 (£10 off)

MS DOS

Analytical Engines' **C Compiler**: £34.44 (10% discount)

Analytical Engines' **C Works**: £75.84 (10% discount)

To HiSoft, The Old School, Greenfield, Bedford MK45 5DE

Please send me HiSoft C for the Spectrum ☐ Amstrad tape ☐ Amstrad disc ☐ MSX (CP/M) ☐ Aztec C Prime plus HiSoft GSX for Amstrad CP/M ☐

I enclose a cheque/PO for £.....

(see above for prices - all are inclusive)

Name

Address

To Precision Software, 6 Park Terrace, Worcester Park, Surrey KT4 7JZ

Please send me Super C for the Commodore 64 ☐ 128 ☐

I enclose a cheque/PO for £.....
(price quoted above is inclusive)

Name

Address

To Analytical Engines, PO Box 35, Eastleigh, Hants SO5 5WU

Please send me Compiler ☐ C Works ☐ for MSDOS machines ☐

Please send me MIX C for CP/M 2.2 machines ☐

I enclose a cheque/PO for £.....

(inclusive prices printed above)

Name

Address

To Metacomco, 26 Portland Square, Bristol BS2 8RZ

Please send me Lattice C for the QL ☐ Atari ST ☐

Commodore Amiga ☐

I enclose a cheque/PO for £.....
(inclusive prices printed above)

Name

Address

As this isn't the simplest of offers, please make sure that you cut out the correct coupon, and send it to the right address! Allow 28 days for delivery. All offers are subject to availability of stock.

30/POPULAR COMPUTING WEEKLY

Prestel-Telecom gateway about to open

David Wallin brings you up-to-the minute news on Easylink's new telex system, the Micronet-Telecom Gold gateway, the new Viewfax and other communications news

This week I've got news of some very interesting developments to do with some of the E-Mail service giants in the UK. Firstly, the telex service. Currently, people who have telex systems available through their E-Mail system, have a telex number which is for a bureau that collects their telex and passes it on. A reference has to be put after the telex number, for example: 265871 MONREF G quoting ref 73.MAG30190.

All that is about to change, or at least on EasyLink it is. EasyLink subscribers are now going to get their own unique telex number and four character answerback (The answerback is sent by the receiving telex machine to identify itself, MONREF, in the above example. G is the country code and means Great Britain). There will no longer be the need for references to be quoted.

Well under way

This change is well under way at present, and subscribers have been asked to let EasyLink know what answerback they wish to use.

The lack of a reference will give the telex number a more professional look and it will look neater when printed on stationery and literature. It will be interesting to see how well the system works compared to present telex/E-Mail systems.

Long promised

Next, on to Telecom Gold and Micronet. The long promised gateway from Micronet to Telecom Gold is now due to open very soon, and there's already a response frame on which you can request an application form.

If you go to page 800111007 on Prestel, there are a few frames of information about InterLink (the name of the gateway), followed by the above mentioned application form - which can also be directly reached on page 811611.

Unfortunately, this gateway links to Telecom Gold's system 74; personally, I feel it would have been better if it were to use

system 72, and register users through Microlink as it has many more features. But, as it says on Prestel, it is free. On 74, the facilities available will be: E-Mail, on-line chat and on-line databases such as World Reporter.

There is a possibility that in the future you will be able to use any of the TG system computers, but at present, the only one is 74.

How's it going to work? Well, you dial up your local Prestel phone number (assuming you are not in the one per cent of the population who does not have Prestel on a local call), and then go through a gateway to Telecom Gold. This means that you only need to make one phone call and you have access to both Prestel and Telecom Gold.

The big advantage is that the E-Mail system on Gold is far, far superior to the one of Prestel, so you get the best of both worlds - the better E-Mail facility of Gold, coupled with the colourful and user friendly environment of Prestel.

Having gone through the gateway, the display will remain at 40 columns with some colour. If you direct dialled, used PSS or Dated, you are stuck with black and white.

Far cheaper

Initially, use of the gateway will be free, though after a month a 1p a minute charge is planned. This is still far cheaper than the 3p a minute charge for use of PSS/Dated route. All charges for Interlink use will be recorded on your Prestel bill, under the heading of Telecom Gold, so you won't be getting separate bills from each service.

One thing which I am unsure of is whether or not the £3 a month standing charge which Telecom Gold charge is being waived, but it's only £36 a year, if not.

I'm sure you've all heard the bad news as regards Viewfax 258 on Prestel, which recently closed down. Unfortunately though it is, up from the ashes of 258 a new database is currently in the planning stage.

The new database is to be called something on the lines of the Leisure Database and aimed at everyone. It will not be part of any CUGs such as Micronet and use of 95%

will be free. Quizzes, software, etc, will have frame charges, but overall the system should be cheap to use.

It is designed to be like a general interest magazine. Though many databases claim to be like this, few, if any, are. A simple style is one of the main aims of the database and if it bears any resemblance to PRESS288, it should meet this specification well.

There is one area which anyone reading this page should be interested in. It's the communications section (of the leisure database), starting with 20 pages and to expand with demand, it will be edited and run by myself and William Holmes. I will write the articles and features, and set up the quizzes, etc, and William will be responsible for most of the graphics.

As I said, we will start with around 20 pages and with demand hopefully expand - 20 pages may sound a lot, but when you take into account things like title pages, menus and a response frame, there's not a lot left.

Musictel

Four to five pages will be dedicated to Musictel. As Musictel is the newest and fastest moving thing in communications, it really needs some on-line space on a system such as Prestel to report any developments.

Each week, the Musictel 'Note' board will contain news of developments (present and planned) in the network; a word or two from James (of Musictel HQ) or maybe one of the other sysops; a complete list of Musictel boards; a response frame to contact Musictel and a list of advertisers on the network (when I get some more pages).

Other features of the section will be news, editorial articles, reviews, adverts (second hand equipment) and the entirely new 'crazy page'. It's crazy for two reasons. Firstly, the frame charge will be between £1.50 and £4 most of the time. Secondly the page will contain great offers - each lasting one month - with things like free MicroLink membership, reduced GODs membership, bargains on hardware and software.

YOUR INVITATION

VENUE:
DATE/TIME:
METHOD
OF ENTRY:
ID NUMBER:
PASSWORD:

Your micro
of your choosing
dial 01-618 1111
4444444444
4444

Micronet and Prestel *
invite you to an eye-opening display of database facilities
'Bring a 1200/75 Baud Modem'

MICRONET/PRESTEL – beating the competition!

MICRONET, DURRANT HOUSE, 8 HERBAL HILL, LONDON EC1R 5EJ TEL: 01-278 3143

* Prestel & the Prestel symbol are registered trademarks of British Telecommunications Plc.



PROGRAMMERS!

The definitive reference guide for all aspiring game programmers FREE when you subscribe to:

POPULAR Computing WEEKLY

- ★ Will help you write high-quality marketable computer games software.
- ★ Explains what qualities you need to succeed and the pitfalls to avoid.
- ★ Extensive advice on writing and marketing the software.

Please enter my annual subscription to *Popular Computing Weekly* at **£25.00 UK, £39.95 Overseas** and send me my **FREE** copy of "Success in Software"

☐ Please debit my Access/Visa/AmEx card no:

[illegible]

Expiry date: Signature:

☐ I enclose a cheque made payable to: Sunshine Publications Ltd.

Name:

Address:

Return this form to: PCW Subs, 12-13 Little Newport Street,
London WC2H 7PP, UK.

The music processor for the ST

Mark Jenkins reviews Tigress Designs' *Iconix*, a new British software package of highly professional class

While the Atari ST has been dominating the world of computer music for the last few months, there are now some signs that the opposition is catching up. Cheetah has released the Amstrad version of their MK5 Midi keyboard, software and interface, and U-Music has staged something of a revival in order to create the UMI 3S, a stripped-down version of the powerful UMI 2B sequencer hardware/software package for the BBC B.

U-Music will be giving a full demo at the forthcoming Acorn User show, and promises updates for the inexpensive 3S which will, in time, give it almost all the abilities of the original 2B. We'll be reviewing both these packages in the next couple of weeks. However, it's about time we had a detailed look at *Iconix* on the Atari ST, a new British software package which is very much in the professional Steinberg/Hybrid Arts class. *Iconix* sells for £249 and comes with an anti-pirating "dongle" and a handbook – there are extensive Help menus in the software as well if you don't want to rely on the handbook all the time.

The basic idea is to provide a completely flexible "music processor" which lets you work any way you want to; in other words, you can either treat the computer's memory as one very long piece of tape, cutting and splicing sections wherever you like, or you can write many short sections and chain them together.

Every group of data recorded by *Iconix* can contain information on all 16 Midi channels, but a group can be as short as one bar or as long as the computer's entire memory.

Like Steinberg's *Pro-24* and many other software packages, *Iconix* uses a representation of a tape recorder's control panel; this is referred to as the Recorder section and can be placed anywhere on the screen, like most of *Iconix*'s facilities.

There's also a clipboard where you can temporarily store notes, segments and elements of a chain while you're not using them, a monitor section which shows what's going on in the groups you're not

listening to (you can run eight groups simultaneously theoretically creating a 128-track recorder!) and a basket to throw away unwanted data.

There are seven pull-down menus at the top of the screen and these cover all the usual functions such as saving and loading songs, calling up whole groups or segments, setting synchronisation options, and defining chains when in song mode. You can control all the record functions using the mouse or the computer keyboard, or

channel number and a solo/mute status associated with it.

Iconix produces a metronome click through the computer's monitor and you record your first piece in time to it. This piece defines the length of your first segment and there are several counter displays to show your current position, a position for drop-ins, drop-outs and so on. One of the most exciting aspects of *Iconix* is the way you can drag the contents of one box straight into another, which saves a lot of tedious typing if you want to set a new cue point, or whatever.

A moving bar graph shows activity on all 16 Midi channels and you can rewind through what you've recorded in various ways. You can set a new tempo while stopped or while playing, and dropping in and overdubbing on *Iconix* is very straightforward. Splicing new material on to the end of an existing section is simply a matter of returning to the group window to define a new group and going back to the recorder to carry on working.

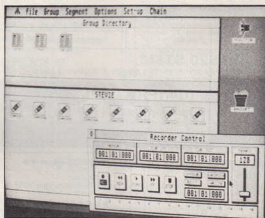
"Replicate" copies notes from one part of a segment to another to create repeated bass lines; this is just a matter

of typing in a line such as 02 BARS FROM 01 into the Replicate box.

You can transpose a segment's pitches, velocities or timing data relative to the rest of the group and the step editor section lays out every Midi event in a group like a vertical piano roll; you can enter new notes using the mouse or Midi keyboard, insert pitch bends and patch changes, alter the length of notes and the speed of onset of control changes, and generally edit your performance with the utmost accuracy.

Overall, though, this is the friendliest, fastest, most powerful sequencer package I've seen to date. It has some opposition coming up in the form of the C-Lab Creator program, but for the moment (and apart from the monochrome monitor business!) *Iconix* comes with an unconditional recommendation.

Iconix, c/o Tigress Designs, 25 Burmester Road, London SW17 0JL, 01-946 7870.



use the Soft Keys page to re-define any controller on your synth to replace the controls on the screen.

Keys, switches, the pitch bend wheel, the data entry slider on a Yamaha DX7 could all be useful if your synths are on one side of the studio and your computer is on the other; the ability to hit (say) the top C to go into record, the next B to stop, the next A to rewind, and to use the modulation wheel to alter tempo as you're playing, is absolutely invaluable.

When you record some music you can save the latest "take" or the one immediately before – you don't have to commit yourself to wiping out an apparently bad take until you're really sure. When you start to record you have to define a new group, which for instance you could call Intro if it's going to be used for the start of a tune.

The group window then opens up and will show you 16 tracks each of which can have an instrument name, a patch number, a Midi

MICRO-FILE

SOFTWARE

ATARI 520 STFM NOW IN STOCK FOR ONLY **£369.95**

ST SOFTWARE AT GIVEAWAY PRICES

Dagdas Elite	49.95	ST Karate	14.95
Silicon Dreams	16.95	Pinball Fact	19.95
Alternate Reality	19.99	Karate Kid	19.95
Borrowed Time	19.99	Mouse Trap	11.99
Cut Throat	26.99	Arena	24.95
Flight Sim. II	39.99	Kings Quest II	24.95
Karate Kid II	19.99	Sky Fox	19.95
McAdam Bumper	19.99	Trivia Challenge	15.95
Spiderman	16.99	Spitfire 40	15.95
SDI	39.99	Rogue	19.95
Road War 2000	19.99	Moonmist	24.95
Pawn	19.95	Tee Up Golf	15.95
Starglider	19.95	2 on 2 Basket	19.95
Typhoon	15.95	Little Comp People	29.95
Winter Games	19.95	Goldrunner	19.95
World Games	19.95	Xevious	19.95
Tenth Frame	19.95	Arkenoid	11.95
O-Ball	14.95	Metro Cross	19.95
Leaderboard	19.95	Balance of Power	26.99
Music Studio	27.95	Championship Football	19.95
Eden Blues	19.95	Shanghai	19.95
Harrier	19.95	Turbo GT Racer	13.95
Toolkit	24.95	ProSound Designer	41.95
Pro Sprite Designer	29.95		
Space Pilot	16.95	This is just a small sample of our	
Mercenary	19.95	ST software and hardware.	
Wrestling	19.95	Phone for complete list.	

SPECIAL OFFER

Atari 520 STM complete with mouse, 1 meg disc drive

£429.95 Complete with manuals and demos

SPECIAL OFFER

Atari 520 STM complete with mouse; SF354 (500K) disc drive; SM125 mono monitor, 1st Word processor

£439.00 WHILE STOCKS LAST - LAST FEW LEFT

AMIGA A500

- ★ 68000 Chip with 512K Rari
- ★ Mouse controller
- ★ Built in speech
- ★ Built in 880K 3 1/2" disc drive
- ★ 4096 colours and stereo sound
- ★ Please phone for details

★ Also wide range of software available

£539.95 NOW IN STOCK

PRINTERS

Panasonic 80-col, 120 cps NLQ mode	£218
Canon A60 80-col, 200 cps, 100 eps NLQ mode	£479
Panasonic 1092 80-col, 180 cps NLQ mode	£375

More printers than we can show. Please ring for details

10 3 1/2" discs **£14.00**

Also Amstrad CPC, PCW, PC IBM software and hardware available

ATARI 520 STFM

Includes: word processor, graphics programme, picture demos and other utilities.

Cemena 1 meg drive £148.95
Special Offer SM125 12" high res.
mono monitor (New only) £119.95

SOUND N VISION

11 Silk St, Leigh, Lancs WN7 1AW.

Phone now for details - Tel: (0942) 673689

Cheques and P/Orders payable to: Sound N Vision P.&P./VAT INCLUDED

Visitors welcome in showroom. Send S.A.E. for price list.



(216)

ESCAPE Software

*** New Release - Available 30th May ***

Q.L. MATHS TUTOR

A menu-driven package that teaches basic arithmetical, geometrical and logical concepts. Aimed at the 5 to 13 age group, but so user-friendly that even an adult could use it! Also includes a Nim and Hi-Lo games.

**** Available Now!! Still at Offer Price ****

Q.L. SPELLING TUTOR

Learn to spell using built-in vocabulary of over 3100 words or build up your own word lists. Suitable for 5 year olds to adults. Includes Hangman, Anagram and Word-Search games.

*** See our demonstration at the ZX Microfair ***

Q.L. SPELLING TUTOR and Q.L. MATHS TUTOR were compiled using Q-LIBERATOR

★ ★ Introductory offer price: £11.50 each inclusive ★ ★

★ ★ Save 10%: buy both for £20.70!! ★ ★

Overseas orders add £1

Send cheques or P.O.s to:

ESCAPE Software (Dept. PCW),
2 Henley Road, Ilford, Essex IG1 2TT
Telephone: 01-478 8281

(260)

★ ★ 99p each ★ ★

Atari — Shonix
Scooter
Olives Follies

Spec — Secret Levitation

★ ★ £1.99 each ★ ★

Spec — Go to: Hell

Hacker

Project Future

I of the Mask

Riddlers Den

MSX — Master of Lamps

Amstrad — Master of Lamps

World Cup

Pack of 5 C15 tapes

★ ★ £2.99 each ★ ★

Spec — Mind Shadow

Rescuer Fractalus

Amstrad — Mermid Madness

Football Manager for Spectrum, C64,

C16, BBC, Electron, Atari and

Amstrad.

POWER SUPPLIES

Spectrum £2.95

Commodore £19.95

Q.L. cartridges £7.50 pack of 4
Commodore music expansion
system

★ ★ ONLY £99.95 ★ ★

PRINTERS

Brother M1009 £129.95

Citizen 1200 £199.95

JOYSTICKS

Petex Microstick £7.95

Fantastick £8.95

THE COMPUTER DEPOT

205 Buchanan Street, Glasgow G1 2JZ.

Tel: (041) 332 3944



Please add 50p postage

ADVERTISING RATES FOR MICRO-FILE

Semi Display
Lineage

£8 per single column centimetre (+VAT)
35p per word (+VAT)

CALL SUSANNAH KING ON 01-437 4343 FOR SEMI DISPLAY ADVERTISING

**BEST
PRICES**

ATARI ST

ATARI 8-BIT

	CLASS.	PRICE
WIZARD CROWN		\$17.95
WHO DARES WINS II		\$8.95
ATTACK OF THE MUTANT GUARDS		\$1.95
FRENESIS		\$1.95
COLONY		\$1.95
LEADERBOARD		\$7.85
MOGWIST		\$119.95
RICK HANSON		—
SILENT SERVICE		\$8.50
SPITFIRE 40		\$8.95
GAUNTLET		\$8.50
TRIVIAL PURSUITS		\$11.95
SPIN DOZZY		\$7.95
VIETNAM		\$7.95
TOMAHAWK		\$2.95

**AMIGA A500 & HARDWARE
COMING SOON**

ONLY £339.95 inc. P.&P.

The price you see is the all inclusive price. Please quote this magazine when ordering. Send cheques & P.O.s to:

**SAXON SOFTWARE, PO BOX 98,
HAYES, MIDDLESEX UB3 1SZ**

KNOW ANYTHING ABOUT COMPUTERS? Then win a Joyce in 'Microquiz'. S.A.E. for full details to: 50 Wakefords Way, Havant PO9 5JH.

Here's my classified ad.

(Please write your copy in capital letters on the lines below)

I make this words, at per word, plus VAT so I owe you £

Name..... [Please add 15% to these rates for VAT]

Address

Telenor

Po

■■■

Please cut out and send this form to: Classified Department,
Computing Weekly, 12-13 Little Newport Street, London WC2H 7PP.

ATARI ST MAIL ORDER SPECIALISTS

ATARI HARDWARE

STANDARD VALUE

ATARI SOFTWARE

\$249.95	COPPERMAN
\$249.95	BACK PACK (ROM)
\$259.95	TRIP SPACE
\$479.95	DEADS
\$549.95	FAST ST BASIC
\$479.95	FLIGHT SIMULATOR II
\$699.95	SET C COMPILER
\$139.95	LOW ST BASIC COMPILER
\$139.95	LEADERSBOARD
\$194.95	M-DISC (RAM DISC)
\$699.95	MERCENARY ST
\$759.00	THE PAVIN
	STARDER
\$299.00	THUNDER
\$999.95	VIP LITE
\$729.95	VIP PROFESSIONAL
\$379.95	WINTER GAMES

ATARI ST BOOKS

£119.95	ABACUS BOOKS 3D GRAPHICS BASIC TO C ST BEGINNER'S GUIDE ST PEKS & POKES
£449.95	FIRST PUBLISHING ATARI ST TRICKS & TIPS GEM ON THE ATARI ST GRAPHICS & SOUND GRAPHIC APPLICATIONS

BLANK 5 1/4" DISCS

ALL DISCS CARRY A 2 YEAR REPLACEMENT
AND COME WITH SLEEVES, LABELS &
PROTECTS.

DISC NETHER - £4.75 OR FREE WITH EACH
PURCHASED

UNBRANDED	25	50
SS48 TPI	£12.95	£24.95
OS48 TPI	£13.95	£26.45
SS90 TPI	£13.95	£26.45
OS90 TPI	£14.95	£27.95

BLANK DISCS

LOWEST PRICES!!!

ALL DISCS ARE 100% CERTIFIED ERROR FREE AND
CARRY A 2 FOR 1 REPLACEMENT GUARANTEE

DUST COVERS

Protect your valuable Hardware with these smart fitting anti-static natural PVC covers with brown bindings.

5205T/STM/STPM/10405TF
SF314/SF354
SM224/SM126/ST224/SC443

Just write for more information. Cheques etc. payable to STORT SOFT. (International orders add 10% and send in pounds sterling.)

18 CROWN CLOSE, SHEERING, BISHOP'S STORTFORD, HERTS CM22 7ND

Conditions: All copy for classified section must be pre-paid. Copy date 7 days before publication.

For phone bookings
Ring Susannah King on 01-437 4343.

COURSES



FOURTH GENERATION LANGUAGES AND WIP COURSES

Expand your software knowledge by taking in the latest fourth generation programming languages and microprogramming packages.

We announce an extensive range of courses, from introductory to advanced level, covering the following subjects:

- Introduction to microprocessors
- Lobe 122
- eBASE II +
- C
- Wordstar
- Display-write 3

Courses are now also available at evenings/weekends and can be presented at a nearby accessible location, on or off-site. Individuals or company bookings are welcome.

For further information please write, stating your requirements, to:

porter-burns incorporated
4 Clive Road, West Hantswood

Or have your details on our 24 hour auto-answer line - 01-328-2712

FOR SALE

SPECIAL OFFER FOR THE MONTH

AMSTRAD PC1512 SOMM £480.00

AMSTRAD PC1512 SOMM £750.00

AMSTRAD PC1512 SOMM £580.00

AMSTRAD PC1512 SOMM £1090.00

Price includes VAT. Please add £10 for P.S.P.

• CPC 6128 (software)	£380.00
• PCW 9512	£410.00
• ACP 7000 (printer)	£402.50
• SMP 3000 (printer)	£157.00
• 10" 3" floppy disk (box of 10)	£13.00
• 5" 1/4 floppy disk (box of 10)	£6.00
• Masterdisk for PCW 9512	£35.00
• Printer Ribbon for PCW 3000	£5.00
• 16 Phone 40 to 10 to P.S.P. 1	£2.00

AMSTRAD CPC SOFTWARE

Mini Office 2 (disk)	£14.50
Personal (disk)	£14.50
Personal 2 (disk)	£14.50
Personal 3 (disk)	£14.50
Personal 4 (disk)	£14.50
Personal 5 (disk)	£14.50
Personal 6 (disk)	£14.50
Personal 7 (disk)	£14.50
Personal 8 (disk)	£14.50
Personal 9 (disk)	£14.50

All prices include VAT and delivery in U.K. only.

We specialise in Amstrad hardware and software.

Please ring for details or send an S.A.E. for our catalogue. Customers make cheques payable to:

CHILTERN COMPUTER CENTRE

100 HIGHTOWN ROAD, LUTON, BEDS LU2 0DQ (UK)

TEL: (0582) 400305

(14)

AMSTRAD PCW SOFTWARE

Personal 2 (disk) (English)

Personal 3 (disk) (English)

Personal 4 (disk) (English)

Personal 5 (disk) (English)

Personal 6 (disk) (English)

Personal 7 (disk) (English)

Personal 8 (disk) (English)

Personal 9 (disk) (English)

Personal 10 (disk) (English)

Personal 11 (disk) (English)

Personal 12 (disk) (English)

Personal 13 (disk) (English)

Personal 14 (disk) (English)

Personal 15 (disk) (English)

Personal 16 (disk) (English)

Personal 17 (disk) (English)

Personal 18 (disk) (English)

Personal 19 (disk) (English)

Personal 20 (disk) (English)

Personal 21 (disk) (English)

Personal 22 (disk) (English)

Personal 23 (disk) (English)

Personal 24 (disk) (English)

Personal 25 (disk) (English)

Personal 26 (disk) (English)

Personal 27 (disk) (English)

Personal 28 (disk) (English)

Personal 29 (disk) (English)

Personal 30 (disk) (English)

Personal 31 (disk) (English)

Personal 32 (disk) (English)

Personal 33 (disk) (English)

Personal 34 (disk) (English)

Personal 35 (disk) (English)

Personal 36 (disk) (English)

Personal 37 (disk) (English)

Personal 38 (disk) (English)

Personal 39 (disk) (English)

Personal 40 (disk) (English)

Personal 41 (disk) (English)

Personal 42 (disk) (English)

Personal 43 (disk) (English)

Personal 44 (disk) (English)

Personal 45 (disk) (English)

Personal 46 (disk) (English)

Personal 47 (disk) (English)

Personal 48 (disk) (English)

Personal 49 (disk) (English)

Personal 50 (disk) (English)

Personal 51 (disk) (English)

Personal 52 (disk) (English)

Personal 53 (disk) (English)

Personal 54 (disk) (English)

Personal 55 (disk) (English)

Personal 56 (disk) (English)

Personal 57 (disk) (English)

Personal 58 (disk) (English)

Personal 59 (disk) (English)

Personal 60 (disk) (English)

Personal 61 (disk) (English)

Personal 62 (disk) (English)

Personal 63 (disk) (English)

Personal 64 (disk) (English)

Personal 65 (disk) (English)

Personal 66 (disk) (English)

Personal 67 (disk) (English)

Personal 68 (disk) (English)

Personal 69 (disk) (English)

Personal 70 (disk) (English)

Personal 71 (disk) (English)

Personal 72 (disk) (English)

Personal 73 (disk) (English)

Personal 74 (disk) (English)

Personal 75 (disk) (English)

Personal 76 (disk) (English)

Personal 77 (disk) (English)

Personal 78 (disk) (English)

Personal 79 (disk) (English)

Personal 80 (disk) (English)

Personal 81 (disk) (English)

Personal 82 (disk) (English)

Personal 83 (disk) (English)

Personal 84 (disk) (English)

Personal 85 (disk) (English)

Personal 86 (disk) (English)

Personal 87 (disk) (English)

Personal 88 (disk) (English)

Personal 89 (disk) (English)

Personal 90 (disk) (English)

Personal 91 (disk) (English)

Personal 92 (disk) (English)

Personal 93 (disk) (English)

Personal 94 (disk) (English)

Personal 95 (disk) (English)

Personal 96 (disk) (English)

Personal 97 (disk) (English)

Personal 98 (disk) (English)

Personal 99 (disk) (English)

Personal 100 (disk) (English)

Personal 101 (disk) (English)

Personal 102 (disk) (English)

Personal 103 (disk) (English)

Personal 104 (disk) (English)

Personal 105 (disk) (English)

Personal 106 (disk) (English)

Personal 107 (disk) (English)

Personal 108 (disk) (English)

Personal 109 (disk) (English)

Personal 110 (disk) (English)

Personal 111 (disk) (English)

Personal 112 (disk) (English)

Personal 113 (disk) (English)

Personal 114 (disk) (English)

Personal 115 (disk) (English)

Personal 116 (disk) (English)

Personal 117 (disk) (English)

Personal 118 (disk) (English)

Personal 119 (disk) (English)

Personal 120 (disk) (English)

Personal 121 (disk) (English)

Personal 122 (disk) (English)

Personal 123 (disk) (English)

Personal 124 (disk) (English)

Personal 125 (disk) (English)

Personal 126 (disk) (English)

Personal 127 (disk) (English)

Personal 128 (disk) (English)

Personal 129 (disk) (English)

Personal 130 (disk) (English)

Personal 131 (disk) (English)

Personal 132 (disk) (English)

Personal 133 (disk) (English)

Personal 134 (disk) (English)

Personal 135 (disk) (English)

Personal 136 (disk) (English)

Personal 137 (disk) (English)

Personal 138 (disk) (English)

Personal 139 (disk) (English)

Personal 140 (disk) (English)

Personal 141 (disk) (English)

Personal 142 (disk) (English)

Personal 143 (disk) (English)

Personal 144 (disk) (English)

Personal 145 (disk) (English)

Personal 146 (disk) (English)

Personal 147 (disk) (English)

Personal 148 (disk) (English)

Personal 149 (disk) (English)

Personal 150 (disk) (English)

Personal 151 (disk) (English)

Personal 152 (disk) (English)

Personal 153 (disk) (English)

Personal 154 (disk) (English)

Personal 155 (disk) (English)

Personal 156 (disk) (English)

Personal 157 (disk) (English)

Personal 158 (disk) (English)

Personal 159 (disk) (English)

Personal 160 (disk) (English)

Personal 161 (disk) (English)

Personal 162 (disk) (English)

Personal 163 (disk) (English)

Personal 164 (disk) (English)

Personal 165 (disk) (English)

Personal 166 (disk) (English)

Personal 167 (disk) (English)

Personal 168 (disk) (English)

Personal 169 (disk) (English)

Personal 170 (disk) (English)

Personal 171 (disk) (English)

Personal 172 (disk) (English)

Personal 173 (disk) (English)

Personal 174 (disk) (English)

Personal 175 (disk) (English)

Personal 176 (disk) (English)

Personal 177 (disk) (English)

Personal 178 (disk) (English)

Personal 179 (disk) (English)

Personal 180 (disk) (English)

Personal 181 (disk) (English)

Personal 182 (disk) (English)

Personal 183 (disk) (English)

Personal 184 (disk) (English)

Personal 185 (disk) (English)

Personal 186 (disk) (English)

Personal 187 (disk) (English)

Personal 188 (disk) (English)

Personal 189 (disk) (English)

Personal 190 (disk) (English)

Personal 191 (disk) (English)

Personal 192 (disk) (English)

Personal 193 (disk) (English)

Personal 194 (disk) (English)

Personal 195 (disk) (English)

Personal 196 (disk) (English)

Personal 197 (disk) (English)

Personal 198 (disk) (English)

Personal 199 (disk) (English)

Personal 200 (disk) (English)

Personal 201 (disk) (English)

Personal 202 (disk) (English)

Personal 203 (disk) (English)

Personal 204 (disk) (English)

Personal 205 (disk) (English)

Personal 206 (disk) (English)

Personal 207 (disk) (English)

Personal 208 (disk) (English)

Personal 209 (disk) (English)

Personal 210 (disk) (English)

Personal 211 (disk) (English)

Personal 212 (disk) (English)

Personal 213 (disk) (English)

Personal 214 (disk) (English)

Personal 215 (disk) (English)

Personal 216 (disk) (English)

Personal 217 (disk) (English)

Personal 218 (disk) (English)

Personal 219

PCW6. Do you own a home micro? Do you want something more than the usual boring games? This is most certainly for you. Don't just play at life, become part of it by starting your own HOME BASE BUSINESS. The benefits are many and varied. Full or part-time, for FREE details S.A.E. to: Mr G. McGovern, (PCW6), 97 Piton Place, King and Queen Street, Walsworth, London SE17 1DR.

ATARI ST OWNERS - write now for a free copy of the latest 24-page ST-Club Newsletter and our public domain disc library catalogue. ST-Club (PCW387), P.O. Box 20, Hertford SG13 8NN. (Stamp appreciated).

CBM 64 AND CASSETTE UNIT COMPETITION Prize 5000 joystick, Introduction to Basic Programming kit, over £300 worth of games and books. Sell £150. Tel: 0621 782565.

Atari 2600 wanted plus games - good price paid. Tel: 0527 32230 (Bromsgrove).

ATARI 2600 STM with 3 megabyte disc drive, manuals, mouse, all for £270 boxed, working. Need the cash? Phone Andy on 01-514 1995 after 7 pm.

AMSTRAD CPC 464, green screen, joystick, lightpen, MP1 TV modulator, over £300 worth of software. Cost over £500, accept £300 o.n.o. Tel: Walton-on-Thames (0932) 231024. After 6pm or weekends.

ATARI ST SOFTWARE CLUB FREE membership. For details ring RM98 0322 526282 ext. 2251 or send s.a.e. Room 98, Sycamore House, Bexley Hospital, Bexley, Kent DA5 2BW.

COMMODORE 128, 1570 disc drive, cassette deck, modem, £350 worth of software, joystick, disc box, ten blank discs, seven discs of Compunet Art demos. Bargain at £275 o.n.o. Tel: 0442 56062.

ATARI 2600 STM+ 3 meg drive, plus GFA, Fast Basic, magazines, books, tons of software. The lot for £395 o.n.o. Tel: Bristol 052759 and ask for Mark. Buyer must collect.

SWAP CMB64, £700 s/w and C2N, plus music expansion system, including full size keyboard, for good Epson printer or compatible Atari FCC i/f and Indus-7 disc drive. Tel: Maidenhead 32875.

SPEC+, Smiths cassette, Quicksort joystick, Art Studio, many games £80 o.n.o. Disciple interface, disc drive, software, many discs, £160 o.n.o. Kirk, Midem, Salford, £40. The lot for £260. Tel: 01-501 2820.

SINCLAIR QL as new, in box, plus over £200 worth books, blank micro-drives and original software, all for £150 o.n.o. Also includes V2.3 Quill v/processor etc. Tel: 01-751 4110.

SPECTRUM+ 48K, brand new in box, mint condition, never used. Only £50. Also many games, including Gaultier, Paperboy, Chess, Silent Force, Leaderboard, Aliens, £5 each; joystick and software £10. Tel: 01-751 4110.

BBC SOFTWARE FOR SALE - Computer His 3, tape £4.50, Moon Cresta, tape £4, Strikers Run, tape £4.50, Hyper Sports, disc £6, and many more. Tel: 0388 833667. After 6pm.

AMSTRAD 6128, colour monitor, Shiva CP80 printer, 2nd drive, AMX mouse, lightpen, software, Multiface II, lots of magazines, cost £1250 sell for £625. Tel: 0226 249995. After 4pm.

C64 only £50; with PSU £70. Data-corder £10. Also lots original discs and cassettes, including Gauntlet, Championship Wrestling, Leaderboard, Mt Pak, Pandrod, Infirator, Rastoo, new cassettes £5, discs £8. Tel: 01-751 4110.

TANDY 100 portable, fully expanded, with programmes, bargain £175, o.n.o. Micro Professor (Apple compatible) with two keyboards and extras, offers. Tel: 0792 816696.

COMMODORE 128, 1541 drive, Star 5G10C, NLO printer, C2N cassette, 30 plus discs, 15 books, 2 joysticks, light rifle, games, all boxed, mint condition, cost over £1200, only £575. Retanna Lodge, Edgcombe, Helston, Cornwall TR13 0EJ.

ATARI 2600 STM plus 3 meg drive, £200 worth of software, only three months old. Sell for £450. Tel: (Ripley) 813940. After 4pm.

AMIGA 512K as new with loads of software, including, Sinbad, Flight Simulator, Pawn, Spacequest and more. Sell for £850. Tel: 01-302 5052 amega.

IRON MAIDEN ADVENTURE GAMES, on one cassette, The Rock, Spectrum 48/128. Sell £5. From Karl Crawford, 90 Westfield Avenue, Redcar, Cleveland TS10 1HG.

COMMODORE 1571 disc drive, new in box, must sell now. £165 o.n.o. Call today, leave message. Tel: 01-878 5579.

COMMODORE 128, 1570 drive, C2N cassette, dust covers, disc box, large selection of disc software, pristine condition. Sell £390. Tel: Gish 0895 72727.

ATARI ST USERS: Huge public domain software library at the best prices anywhere, a monthly magazine, hardware and software at special prices. All from UK-Sub. Write to UK-Sub, 55 West Nest, Westfield, Ipswich IP9 9AJ.

AMSTRAD, COMMODORE, SPECTRUM, BBC software for hire, latest titles, extensive catalogues, details from M. Ryall 1569 Stratford Road, Hall Green, Birmingham.

ATARI accessories/software, as new, boxed, 1027 printer and 1050 disc drive £70 each. Many bargain disc games, adventures, wargames for 800XL and 520ST. Tel: 051.653 5698 (Birkenhead).

SYSTEM FOLDER, Macpaint, Macwrite, list of compatible Mac programs and assorted Atari software. Phone Philip Bunc on 0932 226152 anytime. Complete system £849.

GFA BASIC compilers and interpreters for the Atari ST at only £54.95! GFA is the best BASIC around for the ST. Send for info or send £54.95 stating compiler or interpreter to Bibliotech, Dept PW1, 178 Green Lanes, Palmers Green, London N13 5UE or phone 01-882 7954 anytime.

ATARI 520ST, SF354 colour monitor, Paven H8B78 651C, MCC Pascual, Stargilder, PD Software, thirty blank discs, books, mags, too much to say here. Cost £1400, sell £600. Adrian 0656 736694.

MONITOR - Microvite hi-res colour monitor 14", includes lead to BBC, cost new £150. Sell £80. Tel: 01-866 1248. Evenings. Ask for Paul.

VORTEX 512K memory expansion board for Amstrad CPC464, £50. Tel: Hornchurch 57507.

DATA PROCESSOR with Saga keyboard and datacorder, plus joystick, i/f and joystick, loads of software and carrying case, immaculate condition. Bargain at £90. Tel: Adam on 01-348 0450 after 5pm.

AMSTRAD CPC 464, colour monitor, software including games, assembler, disassembler, plus detailed firmware manuals. £150 o.n.o. Also Spectrum 48K, plus software and joystick set. £50 o.n.o. Tel: Roland 01-399 2798.

ELECTRON COMPUTERS plus power supply - £95. Acorn's Electron Plus 1 interface - £95. Electron software at reduced prices: Tel: School's Computer Club 0932 687789.

AMSTRAD CPC 6128, colour monitor, v.g.c., joystick, some games, data processor. Sell £300. Tel: Southport (0704) 67342.

CBM 128, 1541 drive, Datasette, Freeze Frame 3, joystick, £500. Games (ten Zap golds, ten sizzlers) boxed, worth £1000, sell for £400 o.n.o. Tel: 041-639 1175. Will split, will deliver. Swap for Atari ST?

COMMODORE 64 MUSIC SYSTEM: computer, disc drive, monitor, superb Melodiam music keyboard, £200 software. £450. Tel: 01-987 3538 (Poplar).

COMMODORE 64, Atari 800, BBC-B tapes and discs for sale at very low prices. All originals - BBC Romes, Life View, Printmaster, also cheap disc-wise Romes £25. Phone Mike 01-476 7546 after 6.30 p.m.

Dealers

BIRMINGHAM

SOFTWARE EXPRESS

COMPUTER SYSTEMS LTD

ATARI

We have the largest range of Atari 8 and 16-bit software in the Midlands.

Mail order service available.

514-516 Alum Rock Road,

Alum Rock, (1986)

Birmingham B8 3HX

Tel: 021-328 3585

ESSEX

ESTUARY

PERSONAL COMPUTERS

318 CHARTWELL NORTH
VICTORIA CIRCUS SHOPPING CENTRE
SOUTHEND ON SEA
Tel: (0702) 614131

NOBLES

14-17 EASTERN
ESPLANADE
SOUTHEND-ON-SEA,
ESSEX
Tel: (0702) 63377/8

Dealers

GLASGOW

THE COMPUTER DEPOT
205 DUCHANAN STREET
GLASGOW G1 2JZ
Tel: (041) 332 3944

GLASGOW COMPUTER CENTRE

Atari appointed dealer
and Service Centre
Specialists in Atari ST Computers
VIRGINIA GALLERIES
(1st FLOOR)
33 VIRGINIA STREET
GLASGOW G1 1TU
TEL: 041-552 1522

KENT

LIGHTHOUSE COMPUTER SERVICES

- ★ Specialists in Amstrad
- ★ Mail Order Service
- ★ Software for Amstrad - Single Drive a speciality
- ★ Hot-line help for Amstrad

OWNERS

9 Park Avenue, Deal, Kent CT14 9AL

Telephone:
(0304) 269313
(0304) 362049 (254)

LEEDS

MICROPOWER

NORTHWOOD HOUSE
NORTH STREET
LEEDS LS7 2AA
Tel: (0532) 458000

LONDON

GALLERY SOFTWARE
1st FLOOR
THE ARNDAL CENT,
WANDSWORTH,
LONDON SW18
Tel: 01-870 4941

THIGHTS & CROSSES

(COMPUTERS) LTD.

33 MARKET STREET, HECKMONDWICK, WEST YORKS

COMPUTERS

Amstrad CPC664 with color monitor	
+ £130.00 software	
Amstrad CPC664 with color monitor + disk drive	£289
Amstrad PC1512 2M 320 (2 year drive/monitor)	£289
Amstrad PC1512 4M 620	£211
Amstrad PC1512 8M 620 (single drive/monitor)	£289
Amstrad PC1512 16M 620 (2 year drive/monitor)	£319
Amstrad PC1512 32M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 64M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 128M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 256M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 512M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 1024M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 2048M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 4096M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 8192M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 16384M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 32768M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 65536M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 131072M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 262144M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 524288M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 1048576M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 2097152M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 4194304M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 8388608M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 16777216M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 33554432M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 67108864M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 134217728M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 268435456M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 536870912M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 1073741824M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 2147483648M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 4294967296M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 8589934592M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 17179869184M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 34359738368M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 68719476736M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 137438953472M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 274877906944M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 549755813888M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 1099511627776M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 2199023255552M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 4398046511104M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 8796093022208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 17592186444416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 35184372888832M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 70368745777664M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 14073749155328M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 28147498310656M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 56294996621312M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 112589993226624M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 225179986453248M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 45035997290656M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 90071994581312M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 180143989022624M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 360287978045248M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 720575956090496M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 1441151912180992M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 2882303824361984M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 5764607648723968M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 11529215297446736M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 23058430594893472M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 46116861189786944M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 92233722379573888M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 184467444759147776M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 368934889518295552M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 737869779036591104M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 1475739578073182208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 2951479156146364416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 5902958312292728832M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 118059166245854576M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 236118332491709152M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 472236664983418304M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 944473329966836608M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 188894659993373216M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 377789319986746432M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 755578639973492864M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 151115727986688576M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 302231455973377152M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 604462911946754304M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 1208925823893488608M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 2417851647786977216M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 4835703295573954432M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 9671406591147908864M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 19342813182357817728M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 38685626364715635456M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 77371252729431270912M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 15474250545886253824M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 30948501091772507648M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 61897002183545015296M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 12379400437069002592M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 24758800874138005184M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 49517601748276010368M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 99035203496552020736M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 198070406993104041472M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 396140813986208082944M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 792281627972416165888M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 1584563255944323317776M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 3169126511888646635552M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 6338253023777293271104M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 12676506047554586422208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 25353012095109172844416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 50706024190218345688832M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 1014120483804366917776M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 2028240967608733835552M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 4056481935217467671104M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 81129638704349353422208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 16225927548868686844416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 32451855097737373688832M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 6490371019547474737776M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 12980742039094949475552M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 25961484078189898951104M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 51922968156379797902208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 103845923127595959044416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 2076918462551919181888832M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 41538369251038383637776M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 83076738502076767275552M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 166153477041535344551104M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 3323069540830706881102208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 664613908166141377222208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 1329227817332827454444416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 265845563466565490888832M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 53169112693313098177776M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 10633822586626196355552M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 2126764517325239271104M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 42535290346504785422208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 85070580693009570844416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 170141161386019141688832M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 34028232277203828337776M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 68056464554407656675552M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 136112929108815331331104M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 2722258582176666266622208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 544451716435333253324416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 1088903528706666066648832M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 2177807057413332133397776M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 4355614114826664266695552M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 8711228229653328533391104M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 1742245457310666666682208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 3484490914621333333364416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 6968981829242666666728832M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 139379635648533333334551104M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 2787592712970666666691102208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 557518542594133333338222208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 111503705188826666667644416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 223007410377653333335288832M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 44601482075530666667057776M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 892029641510613333341155552M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 17840592230212666668231104M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 356811844604253333364622208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 71362368920850666672924416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 14272473760171333335848832M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 28544947520342666671697776M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 570898950406853333333391104M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 1141797900813706666667782208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 228359580162741333335564416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 4567191603254826666711328832M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 9134383206509653333322657776M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 18268764013019306666453155552M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 365375280260386133339071104M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 7307505605207722666681422208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 146150112104154533336844416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 292300224208309066673688832M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 58460044841661813333737776M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 116920089683326366674755552M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 23384017936665273333951104M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 467680358733305466679022208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 935360717466610913333804416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 187072143493321826667608832M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 374144286986643653332117776M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 7482885739732873066643355552M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 1496577157665574613333671104M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 2993154315331149266673422208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 598630863066229853336844416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 119726172613565796667688832M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 2394523452271315133333737776M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 47890469045426302666714755552M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 957809380908526053332951104M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 19156187618175241066649022208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 3831237523635048213333804416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 7662475047270096426667608832M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 15324950954540192533332117776M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 30649901909080385066643355552M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 6129980381816077013333671104M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 12259960636321344266673422208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 2451992127264268853336844416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 4903984254528537706667688832M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 9807968509057075413333804416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 1961593701814151066649022208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 392318740362830213333804416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 784637480725660426667608832M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 1569274614513210533332117776M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 3138549229026421066649022208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 627709845805284213333804416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 125541971610564426667608832M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 2510839432211288906673422208M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 50216788644225778133336844416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 1004335728884555546667688832M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 20086714577701110913333804416M 620 (single 2M drive/monitor)	£319
Amstrad PC1512 40173429155402221826667608832M	

NEW RELEASES

Your complete guide to all the software released this week

Amstrad CPC

Program Cosmic Shock Absorber
Type Arcade Price £8.95 (tape)
£14.95 (disc) Supplier Martech,
Martech House, Bay Terrace,
Pevensey Bay, East Sussex BN24
6EE.



Shoot 'em up with brain-bender element. Minimal instructions make this Starglider lookalike a test of deduction as you try to mend your wonky craft before the aliens blast you.

Program Deathscape Type Arcade
Price £3.99 (tape), £14.99 (disc)
Supplier Starlight, AriolaSoft, 68
Long Acre, London WC2E 9JH.

Program Passengers on the Wind
Type Adventure Price £9.95 (tape),
£14.95 (disc) Supplier Infogrames,
Mitre House, Abbey Road, Enfield,
Middlesex EN1 2RQ.

Like some unholy hybrid of *Ant Attack* and *Highway Encounter*, *Gremlin's Alien Evolution* looks good and offers some stimulating challenges.

Set on a post-holocaust world, infested by evil aliens, the game is presented in four-way scrolling perspective using nicely detailed monochrome Spectrum graphics. The scenery consists of a maze of walls and hedges, interspersed with master transporters and alien installations.

Your groundcraft is armed with a limitless supply of four kinds of weapon: mines, bombs, TNT and lasers. The trick is to work out which weapons destroy which aliens. Weapons are selected from an icon menu to the right of the screen.

There are also shiny bubbles which can be pushed around the screen, to act as barriers to keep off the more violent aliens, I presume. But there could be more to it...

Things get more complicated when the aliens you've destroyed start to mutate into faster and more dangerous forms. Polishing off four different strains and their descendants gets you onto the next level.

Although the scrolling isn't particularly smooth, it's pleasingly fast.

Alien Evolution features some nice classical title music and looks altogether like a well-conceived and programmed blast. And when you consider that it's only £4.99, you realise that it's more than well worth the money.

Apparently the comic book this is based on is so-o-o-o filthy Infogrames didn't dare include a copy with the game.

The game is *très bon* though – a Napoleonic romp of an adventure that plays like a strip cartoon, not a book. It's all icon driven and looks absolutely beautiful. Tough but fun, *mes petits!*

Program Pneumatic Hammers
Type Arcade Price £1.99 Supplier
Firebird Silver, 74 New Oxford
Street, London WC1A 1PS.



Program Prohibition Type Arcade
Price £9.95 (tape), £14.95 (disc)
Supplier Infogrames, Mitre House,
Abbey Road, Enfield, Middlesex
EN1 2RQ.

Program Pulsator Type Arcade
Price £8.95 (tape), £14.95 (disc)
Supplier Martech, Martech House,

Bay Terrace, Pevensey Bay, East
Sussex BN24 6EE.

Big maze game with a collection of keys and groups of gates to confuse the issue.

Program Strike Type Arcade
Price £2.99 Supplier MAD, 8-10 Paul
Street, London EC2



Atari ST

Program Super Conductor Type
Application Price £49.95 Supplier
Microdeal Ltd, Box 68, St Austell,
Cornwall PL25 4YB.

... As in Sir Adrian Boult, not in applied physics. A 16 track Midi sequencing package.

Program Prohibition Type Adventure
Price £19.95 Supplier Infogrames,
Mitre House, Abbey Road,
Enfield, Middlesex EN1 2RQ.

Program Passengers on the Wind
Type Adventure Price £24.95 Supplier
Infogrames, Mitre House, Abbey
Road, Enfield, Middlesex EN1
2RQ.



Atari XL/XE

Program Chimero Type Arcade
Price £1.95 (disc) Supplier Firebird
Silver, 74 New Oxford Street, London
WC1A 1PS.

Program Micro Rhythm Type Application
Price £1.99 Supplier Firebird
Silver, 74 New Oxford Street,
London WC1A 1PS.

BBC B

Program Birdstrike Type Arcade
Price £1.99 Supplier Firebird Silver,
74 New Oxford Street, London
WC1A 1PS.

See Electron for comment.

Program The Hacker Type Arcade
Price £1.99 Supplier Firebird Silver,
74 New Oxford Street, London
WC1A 1PS.



Commodore 64

Program Deathscape Type Arcade
Price £9.99 (tape) £12.99 (disc)
Supplier Starlight, AriolaSoft, 68
Long Acre, London WC2E 9JH.

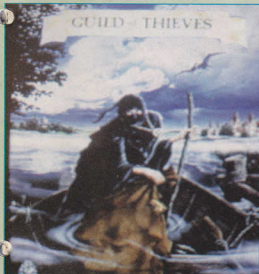


continued on page 43 ►

Hall of Fame

Program *Guild of Thieves* Type
Adventure Micro Amiga, Atari ST
Price £24.95 Supplier Rainbird, 74
New Oxford Street, London WC1A
1PS

GUILD



Guild of Thieves: set in Kerovnia, same territory as *The Pawn*, including mountains, castles, wheat fields and an uncrossable river.



This area of scrub is overgrown with stunted saplings and tangled undergrowth. Northward is the seat of a heavily castle which runs into the river on your east. Southward lies the Jetty and the scrub continues to the south and west.



From here, the hill you are on looks more like a mountain as the slopes above are covered in a thick blanket of snow. There is an opening leading west into the hill, shrouded in seemingly impenetrable darkness. To the east lies a region of scrub and southward is a wood.

OF THIEVES

Wanted - thieves, rascals, rapscallions and other light-fingered types. Rewards - riches for successful applicants for this high risk job. Apply - Kerovnia Guild of Discreet Entry and Removal Operatives.

When Magnetic Scrolls issues an invitation to return to the land of Kerovnia, setting of *The Pawn*, few computer users will be able to resist, though unless you own an Amiga or ST you'll have to wait a while. Commodore 64, Atari 8-bit, CPC and PCW versions are all planned for release at some stage, however.

You start *Guild of Thieves* well at sea, though this is more in the literal than the metaphorical sense, and it shouldn't take too much wit to discover how you get out of the boat and onto the jetty.

From there on you are facing a mission to ransack the treasure house of an island kingdom and return to the master thief, who's acting as your mentor on this mission, with proof of your thieving abilities.

As you make your whistle stop tour of the island you'll encounter the usual selection of Kerovnian characters, all of whom may or may not be useful in your mission.

Location descriptions are as atmospheric and literary as you could hope. Wandering for a while will take you across a wheat field, into a forest, up a mountain with tantalising caves and to the banks of an uncrossable river.

Eventually, though, you'll come to the castle and that's where the fun begins as you discover what riches the cham-

bers hold.

As with its predecessor, there's a selection of pretty, pastel pictures. All very Magnetic Scrolls, very Laura Ashley.

Add to these the clever, cypher-like hints feature, which can be invaluable if you find yourself stumped. There's no doubt that the whole game is very similar in style to *The Pawn*, so don't expect any wild departures in parsing capability or format.

Finally, Magnetic Scrolls 'guild' the lily with some wacky packaging including your own copy of *What Burglar?* magazine. It looks like Rainbird has got another light-fingered winner.

John Minson

Program *Guild of Thieves*
Type Adventure Micro
Amiga, Atari ST Price £24.95
Supplier Rainbird, 74 New
Oxford Street, London
WC1A 1PS

Hints Box

- When leaving the boat, don't try walking on the water.
- While you're in the woods, don't neglect to explore properly, in search of the temple. But watch for traps as you move in it.
- Getting into the castle can cause problems; offer a helping hand to an old man.
- Moving modern masterpieces in the king's bedroom uncovers a secret, but look before you leap.

Available for BBC B
and soon for
AMSTRAD CPC SERIES
640/128
SPECTRUM 48/128



FIREBIRD SOFTWARE, FIRST FLOOR
24-26 NEW OXFORD ST., LONDON WC2

FIREBIRD IS A REGISTERED TRADE MARK
OF BRITISH TELECOMMUNICATIONS PLC

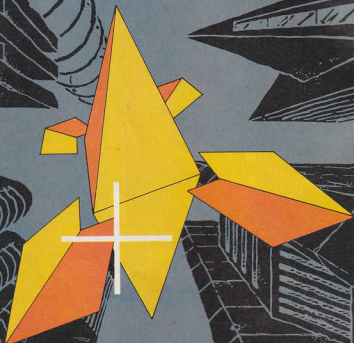
PRICED:

£14.95 CASSETTE

£17.95 DISC (CBM, BBC)

£19.95 DISC (AMSTRAD)

CHOLLO




FIREBIRD


GOLD

◀ continued from page 40

Program Force One Type Arcade
Price £9.99 **Supplier** Firebird Silver, 74 New Oxford Street, London WC1A 1PS.

Program I. Ball Type Arcade Price
 £1.99 **Supplier** Firebird Silver, 74 New Oxford Street, London WC1A 1PS.

Program Metrocross Type Arcade
Price £9.99 (tape), £14.99 (disc) **Supplier** US Gold, Unit 2 & 3 Holford Way, Holford, Birmingham B6 7AX.



Jolly jump and dodge arcade conversion. Some sacrifices have been made from the original ST version, which is small comfort to C64 owners. But all the same, it's horrendously addictive, providing you're in brain-off mode.



Program Milk Race Type Arcade
Price £1.99 **Supplier** Mastertron, 8-10 Paul Street, London EC2.



Program Treasure Island Type Adventure
Price £1.99 **Supplier** Mastertron, 8-10 Paul Street, London EC2.

Program Twin Tornado Type Simulation
Price £9.95 **Supplier** Doctor Soft, 66, East Preston, Littlehampton BN16 2TX.



Program Wiz Type Arcade/Adventure
Price £9.95 (tape) £14.95 (disc) **Supplier** Melbourne House, 8-10 Paul Street, London EC2.

Program Wizball Type Arcade
Price £8.95 (tape) £12.95 (disc) **Supplier** Ocean Software, 6 Central Street, Manchester M2 5WS.

Program Election Type Arcade
Price £9.95 **Supplier** Virgin Games, 2-4 Vernon Yard, London W11 2DX.

You've guessed it - this is a general election game, featuring Thatcher, Nunnock, Owing and Pig Iron and you as Daniel Pauls, leader of the Idealist party. Anyone still awake at the back there?

Program Falcon Type Adventure
Price £9.95 **Supplier** Virgin Games, 2-4 Vernon Yard, Portobello Road, London W11 2DX.

Claiming to be the first ever multi-user flight simulator - funny, we're sure we remember at least one other - you can wire two C64s together for the standard collection of complex controls as you fly into battle.

C16/Plus 4

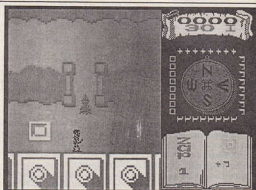
Program Terra Nova Type Arcade
Price £7.95 **Supplier** Anco, 4 Westgate House, Spital Street, Dartford, Kent.

Electron

Program Birdstrike Type Arcade
Price £1.99 **Supplier** Firebird Silver, 74 New Oxford Street, London WC1A 1PS.

Shoot the planes and pot the pigeons to name that tune. Standard shoot 'em up.

Program The Hacker Type Arcade
Price £1.99 **Supplier** Firebird Silver, 74 New Oxford Street, London WC1A 1PS.



Wiz. Short for Wizard, eh? Hours of thought must have gone into that one, down at Melbourne House. And would you believe the game is just as original?

The plot, as such, concerns the meeting of the worlds of Light and Dark in one almighty clash. On Magical Isle the manifestations of evil are reaching epidemic proportions.

The Council of Wizards is reluctant to act though, because the only solution would be to destroy the link between the worlds, and in the dark world there are two runes which are still needed for spell-casting.

Ho-hum! The upshot of all this is that you need to become a fifth level wizard and acquire the spells before you can break the link.

But not so fast. There are hordes of hungry beasts after your hide plus something called the Tracer, which would you believe - tracks you relentlessly? You can't even destroy it, just send it back to its own world, temporarily.

Even without plots like this can be redeemed if the game is up to scratch but... this one isn't. The background and small and blobby sprites are colourful enough but the scrolling is numbingly slow. The end result is a third-rate Druid clone sold at full-price.

Duncan Evans

continued on page 44 ▶

NEW RELEASES

◀ continued from page 43

Apple Macintosh

Program *Jewels of Darkness Type Adventure* **Price** £19.95 **Supplier** Rainbird, 74 New Oxford Street, London WC1A 1PS.



IBM PC and compatibles

Program *A-B-C Type Application* **Price** £171.35 **Supplier A-B-C Systems, Regent House, 188 High Street, Sutton SM1 1HH.**

All-in-one business suite with word processor, spreadsheet, accounts, database and desk utilities.



Program *Five-a-Side Soccer Type Arcade/Simulation* **Price** £9.95 **Supplier Mastertronic, 8-10 Paul Street, London EC2.**

Program *Lord of the Rings Type Adventure* **Price** £19.95 **Supplier Melbourne House, 8-10 Paul Street, London EC2.**

Program *Pro Golf Type Arcade/Simulation* **Price** £9.95 **Supplier Mastertronic, 8-10 Paul Street, London EC2.**



Program *Passengers on the Wind Type Adventure* **Price** £24.95 **Supplier Infogrames, Mitre House, Abbey Road, Enfield, Middlesex EN1 2RQ.**

Program *Alien Evolution Type Arcade* **Price** £4.99 **Supplier Gremlin, Alpha House, 10 Carver Street, Sheffield S1 4FS.**

Program *Deathscape Type Arcade* **Price** £8.99 **Supplier Starlight, Ariolasoft, 68 Long Acre, London WC2E 9JH.**

Program *Kick Boxing Type Arcade* (Adventure) **Price** £11.99 **Supplier Firebird Silver, 74 New Oxford Street, London WC1A 1PS.**

Program *Pulsator Type Arcade* **Price** £7.95 **Supplier Martech, Martech House, Bay Terrace, Penvensey Bay, East Sussex BN24 6EE.**

See Amstrad CPC for comment.

Program *The Best of 3D Type Arcade* **Price** £8.99 **Supplier Vortex, US Gold, Unit 2 & 3 Holford Way, Holford, Birmingham B6 7AX.**

... Or the Best of Costa Panay. All classics in their day. *Android Two*, *Tornado Low Level*, *Highway Encounter* and *Revolution* still hold up pretty well... and this compilation won't Costa Packet!

Program *Wiz Type Arcade/Adventure* **Price** £7.95 **Supplier Melbourne House, 8-10 Paul Street, London EC2.**

See box for comment.

Program *Mag Max Type Arcade* **Price** £8.99 **Supplier Imagine Software, 6 Central Street, Manchester M2 5NS.**

Program *Falcon Type Adventure* **Price** £9.95 **Supplier Virgin Games, 2-4 Vernon Yard, Portobello Road, London W11 2DX.**

There was a time when the name Tony Crowther was one to be conjured with. After the success of Alligata's *Blogger* and *Loco*, all weebly music and knock-out graphics, things started to go downhill with the appearance of the suspiciously familiar *Black Thunder* and *Suicide Express*.

Now Tony, after drifting from one company to another, like some Flying Dutchman of the software industry, has fetched up at Ariolasoft's Reaktor label and is reduced to producing Jeff Minter lookalikes. A sorry tale!

Challenge of the Gobots is a horizontally scrolling shoot 'em up, based on those Japanese robots that turn themselves into kitchen appliances. While Ocean's *Transformers* was clever but slow, Crowther's robot game opts for the fast and simple approach.

It would be a fairly straightforward *Defender* style game if not for the inclusion of Minteresque gravity effects. Your flying robot can land on either the floor or the ceiling.

Your task is to knock out invaders' bases by collecting scooters (scooters??). You then drop these Vespas on the bases. You can also mine rocks to drop on the less well-protected enemies.

There are plenty of bloopy sprite effects, zooming baddies and zippy sounds, but they can't disguise the fact that the whole game is deadly dull.

Also included in the limited edition only, is an illustrated 'software book' on the flip side of the cassette, which explains the plot in more detail and ties in with the Gobots' background story. I'm convinced it's Lenny Henry telling the story, although Ariola says not, and the music is infuriatingly catchy and sounds uncannily like *Space Detective* by Robert Schroeder.

Chris Jenkins



SOFTWARE EXPRESS

514-516 Alum Rock Road, Alum Rock, Birmingham Tel.: 021-328 3585

THE ELECTION PROGRAM FROM SOFTEX

by I. A. Skelly

- ★ Mouse driven
- ★ Help screens
- ★ Colour maps
- ★ Analysis by region
- ★ Full print-out facilities
- ★ Four types of "swingometer"
- ★ Graph or tabular display
- ★ Turnout statistics
- ★ Edit facility

Conservative	?
Labour	?
Alliance	?
Others	?

- ★ Displays by maps and constituency colours
- ★ Evaluates impact of tactical voting
- ★ Identifies constituency of any M.P.
- ★ Identifies and forecasts results in marginal seats
- ★ and many other features

Invaluable aid to politicians, schools, colleges, pollsters, political pundits, researchers and ANYONE with an interest in election results and statistics

A complete database of opinion polls and election results since 1900

520/1040 ST (Colour only)

£29.95 (inc. VAT)

Update discs available after each major election . . .

Phone for details

I enclose a cheque/PO for £

OF PHONE FOR



or



Name.....

Address.....

Dealer and Overseas Enquiries Welcome

**514-516 Alum Rock Road,
Alum Rock, Birmingham**



**HOTLINE
021-328 3585**

Make a million

You too can earn a million pounds with your ZX81."

Have you noticed all the adverts which appear sporadically in the computer press, offering to make you rich? I wonder how many readers have answered these adverts and are now living a comfortable existence on the profits made from their new enterprise.

A few years ago, in the infant years of personal computing, I answered such an advert. In return for my few pounds of hard earned money I received a small set of duplicated sheets, loosely stapled into a small pamphlet.

Enclosed in these sheets were a number of ideas to be used to create my fortune. The first of these ideas was to form a

software company, and for this I was told I would need no experience whatsoever.

All I had to do was to advertise for programs in the computer press and then pick the best from the resulting flood of applicants. These could then be duplicated and sold off by mail order using the same advertising media.

The second idea proposed was to offer the services of my machine to the local business world. The proprietors of said businesses would soon be falling over themselves in the rush to use my 'businessman's dream'. I'd never heard my ZX81 called that before!

I wonder how many businesses have gone under while the auditor attempted to understand the printout from a ZX printer, or the workforce argued about the mistakes in their wage packets. I am confident that this idea was produced by the accountancy profession as it was sure to double the time taken by your accountant.

The third idea looked a better bet at the time. This consisted of purchasing hardware and software, again through the computer press! Once purchased, the goods

were to be thoroughly cleaned and tested before being sold back to the queues of eager buyers.

The trouble with this was that in the early days of home computing if you bought a computer one day, by the end of that week you could well have seen its 'new' value in your local chain store fall below your second-hand purchase price! The other major problem being the price the public expected you to pay for their kit; after all, if it cost them £49.99 why shouldn't you pay them £40 or £39?

The final idea, and undoubtedly the best, was to use your computer to produce small A4 pamphlets. These could be on any subject from DIY plumbing to 101 ways to earn money from your home computer. Once compiled, you could advertise in the local and national press, depending on the subject matter, and sit back and wait for the post office van to pull up outside.

So you see it is possible to make a million with your computer. All you have to do is persuade 200,000 people to buy your pamphlet, *How to Make a Million From Your Home Computer*.

PUZZLE

Puzzle No 259

Percy has just computerised his supermarket! In order to increase efficiency, and to keep an up-to-date record of his stock he has installed a simple method of keeping an updated tally of his sales.

Each product now has a four digit code from 0000 to 9999, in order to identify it. This number appears on the price ticket attached to the product, so the cashier at the checkout simply enters this code into the computer, and the computer then does the rest.

The key pads are as shown in the diagram, and

7	8	9
4	5	6
1	2	3
0		

very soon after the system was introduced, the cashiers found that some product codes were 'quick' to enter, whereas others were not.

A 'quick' number is one in which each successive digit is either a repeat of the digit before it, or which uses an adjacent key. A 'non-quick' number involves a jump over an intervening key.

For example, 1265 is a 'quick' number as 1 is adjacent to 2, 2 is adjacent to 6 (even diagonally), and the 6 is then repeated. On the other hand 1066 is not quick, as it involves a jump between the zero and the 6.

Clearly, it would be an advantage to use as many quick numbers as possible in the system. Of the ten thousand possible codes with four digits, how many are 'quick' and how many are not?

Solution to Puzzle No 254

The multiplication was $2332 \times 4 = 9328$.

Each of the three values O, T and I are generated in the three FOR/NEXT loops. As each is generated it is checked against those already in use to prevent duplication of digits.

The value of 'OTTO' is calculated in line 130, and the product is found by multiplying this value by 'I'. This result is converted into a string

variable and digits in common with those in the multiplier (T and O) are checked.

If these match, and the other two digits (S and P) are different, the results are printed.

Winner of Puzzle 254

This week's winner is Denise A Holme, who will receive £10.

Closing date for Puzzle 259 is June 17.

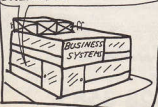
```

100 FOR O=1 TO 9
110 FOR T=0 TO 9
120 IF O=T THEN 250
130 OTTO=O*1000+T*100+T*10+O
140 FOR I=1 TO 9
150 IF I=O OR I=T THEN 240
160 ST=OTTO+I
170 IF ST>9876 THEN I=9:OTTO=240
180 ST=ST*(ST)
190 IF VAL(MID$(ST,2,1))<>T OR VAL
(MID$(ST,3,1))<>O THEN 240
200 S=VAL(MID$(ST,1,1)):P=VAL(MID
$(ST,4,1))
210 IF S=O OR S=T OR S=I OR S=P THEN
240
220 IF P=O OR P=T OR P=I THEN 240
230 PRINT O;T;I;O;T;I;I;T;T;I;I;P
240 NEXT I
250 NEXT T
260 NEXT O

```

HACKERS

Wise choice sir. A briefcase micro is just the thing for the businessman on the move.



Oops! Nearly forgot.



Your peripherals.



WOOLWORTHS

▶ TOP 30 ◀

COMPUTER SOFTWARE

MAY 1987

NO.	TITLE	SOFTWARE HOUSE	FORMAT	PRICE
1.	Enduro Racer	Activision	Spectrum	9.99
2.	6 Pack	Elite	C64	9.95
3.	6 Pack	Elite	Spectrum	9.95
4.	World Games	U.S. Gold	Spectrum	8.99
5.	Auf Wiedersehen Monty	Gremlin	Spectrum	7.99
6.	Arkanoid	Ocean	C64	8.95
7.	Gauntlet	U.S. Gold	Spectrum	8.99
8.	Star Raiders 2	Electric Dreams	C64	9.99
9.	Gunship	Microprose	C64	14.95
10.	Arkanoid	Ocean	Spectrum	7.95
11.	Nemesis	Konami	C64	8.95
12.	10th Frame	U.S. Gold	C64	9.99
13.	Bombjack 2	Elite	Spectrum	7.95
14.	Saboteur 2	Durrell	Spectrum	7.95
15.	Nemesis	Konami	Spectrum	7.95
16.	Marble Madness	Ariolasoft	C64	9.95
17.	Leaderboard	U.S. Gold	Spectrum	9.95
18.	Samurai Trilogy	Gremlin	C64	9.99
19.	Escape From Singes Castle	Software Projects	Spectrum	7.95
20.	Ranarama	Hewson	Spectrum	7.95
21.	Konami Coin Op	Imagine	Spectrum	9.95
22.	5 Star Games Vol. 2	Beau-Jolly	C64	9.95
23.	Paperboy	Elite	Spectrum	7.95
24.	Auf Wiedersehen Monty	Gremlin	C64	9.99
25.	Paperboy	Elite	C64	9.95
26.	Gauntlet	U.S. Gold	C64	9.99
27.	Konami Coin Op	Imagine	C64	9.95
28.	6 Pack	Elite	Amstrad	9.95
29.	5 Star Games Vol. 2	Beau-Jolly	Spectrum	9.95
30.	World Games	U.S. Gold	C64	9.99

HYDROFOOL

"...Worth shelling out for..."
The Woolwich Arsenal Times

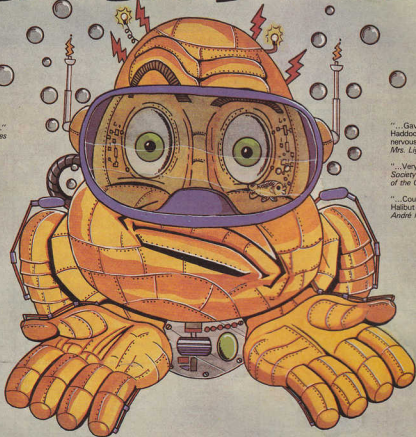
"...A game for the hard
of herring..."
'Hearsay' Magazine

"...Whale Kipper Wheel
home in the Est-side..."
Cardiff Choir News

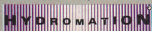
"...Gave me a bad
Haddock and made me a
nervous wreck..."
Mrs. Lighthouse

"...Very fishy..."
*Society for the Preservation
of the Obvious.*

"...Could have filled the
Halibut Hall..."
André Prawn



Featuring...



SPECTRUM £7.95 AMSTRAD £8.95

AVAILABLE MID-MAY

Fresh from his dismal triumph on Knutz Folly, Sweevo is thrust onto the watery world of **DEATHBOWL**, a planet which, for no good reason, has been converted into a gigantic aquarium.

Will Sweevo succeed in his mysterious mission — or will the Great Bowl-Keeper pull the plug on him?

HYDROFOOL is a fast, 3-D, seek, chase, puzzle and laugh game, featuring the fabulous but irrelevant **HYDROMATION**.

